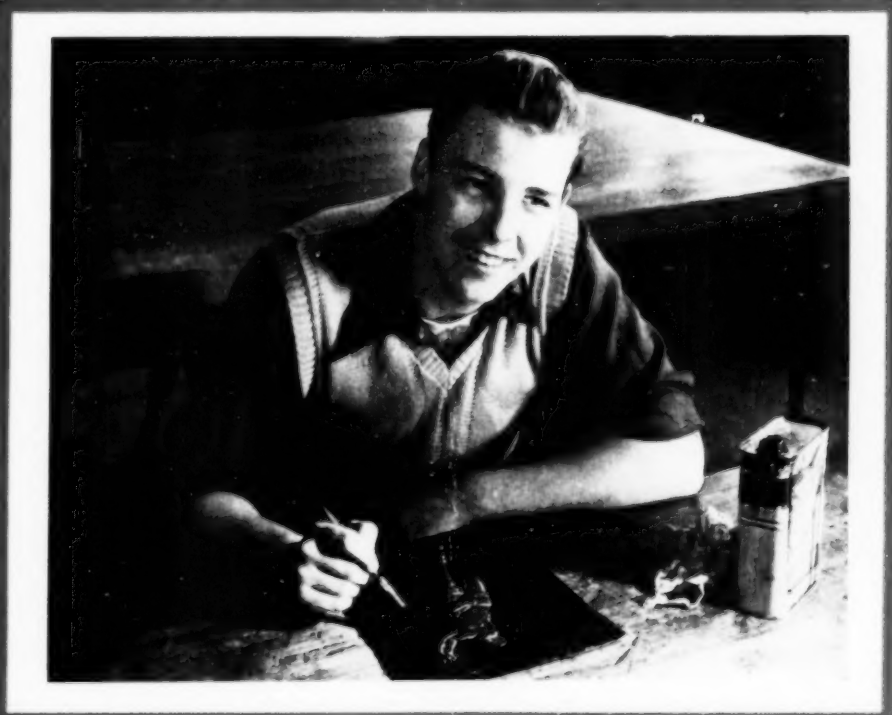
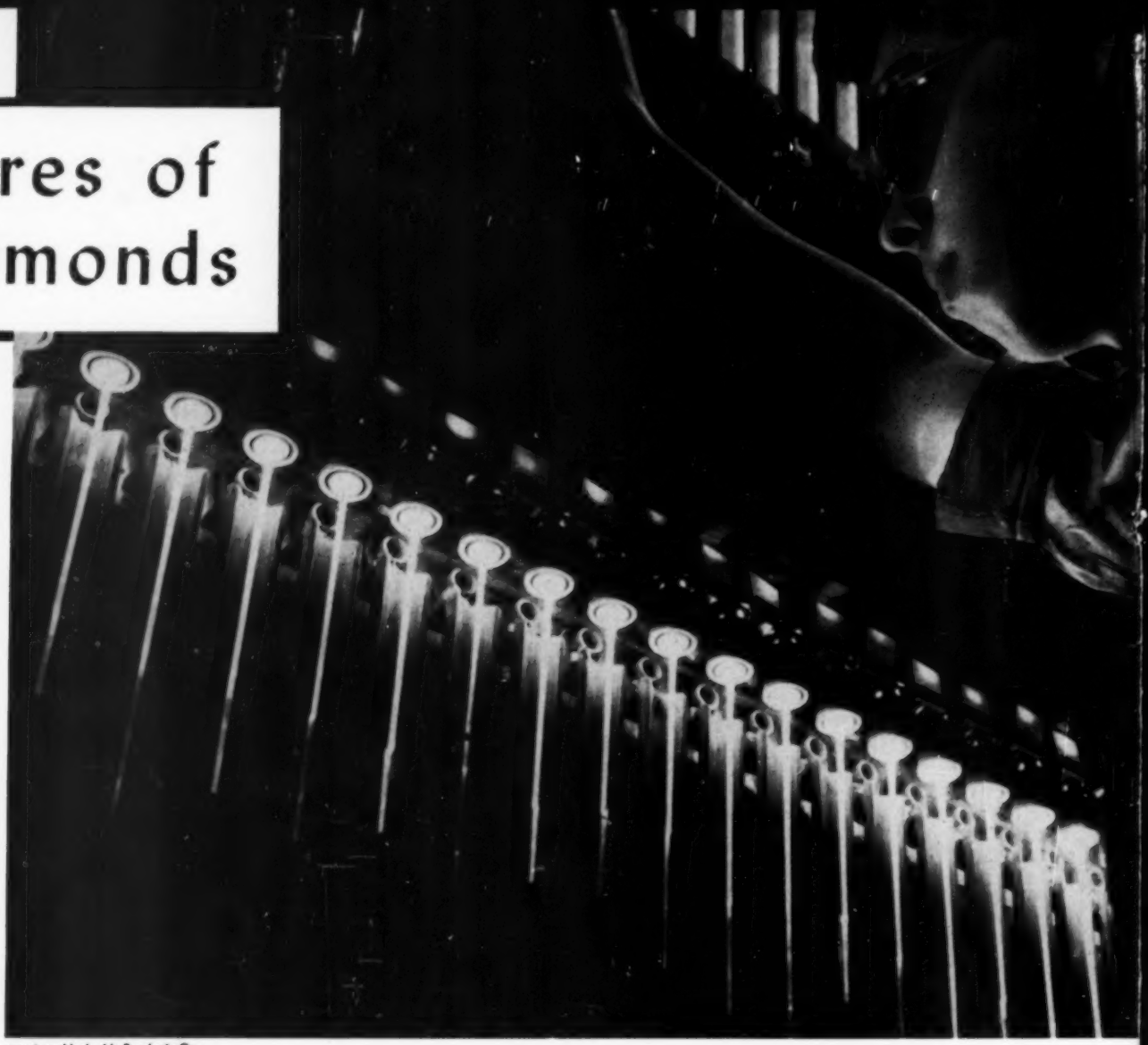
Industrial Arts and Vocational Education

The SHOP TEACHERS' PROFESSIONAL MAGAZINE

December, 1953 Vol. 42, No. 10



Acres of Diamonds



Eisendrath photo, courtesy Linde Air Products Co.

Years ago, Russell Conwell wrote a story about a man who hunted the wide world over for riches. After he returned, broken and defeated to die, acres of diamonds were discovered in his own backyard.

The story was so popular because it is so true. The source of any wealth, material or spiritual, is at home—in a man's mind. For example, Linde Air Products Company is "growing" sapphires and rubies finer than those found in the East . . . in its own "backyard," in a hot retort process discovered by mind power.

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That is why mechanical drawing under the guidance of a good teacher is a "natural" in the establishment of this process. Here the native energy each lad possesses is channelized, his efforts disciplined and specifically adapted to the achievement of goals not different from those of manhood. Mechanical drawing leads directly to engineering and architecture, to the fundamental skills, standards, and habit of judging well of vital use in later life. It gives proof positive by focusing a boy's attention on his inner, creative powers.

Interest here aroused must be made to burst into flame that burns the brighter for each step of progress. Nothing must be permitted to dampen this ardor, no breath of inconsistency, no intimation that anything connected with the work is unimportant. To allow his students to work with drafting instruments of inferior quality, flimsy workmanship, tools bought solely because they are "cheap" is a contradiction of aim a conscientious instructor will not permit. He knows the tremendous power of suggestion fine quality and a good name possess.

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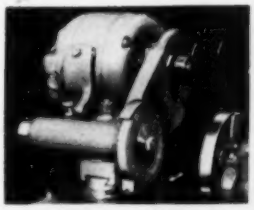
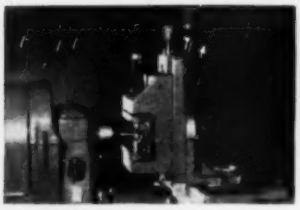
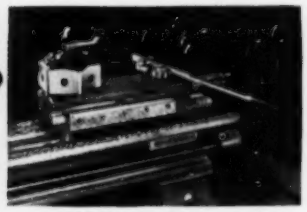

External Grinder


Milling Attachment

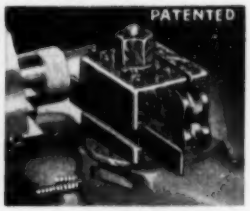
Handlever Tailstock


Handlever Bed Turret

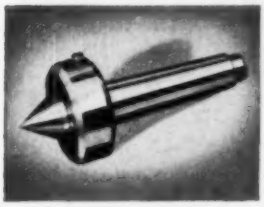
Telescopic Taper Attachment

Handwheel Collet Attachment

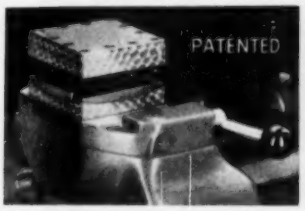
Handlever Collet Attachment



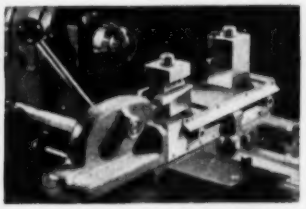
10 in 1 Tool Holder

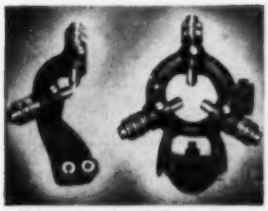

Ball Bearing Live Center

Adjustable Collet Bushing Chuck



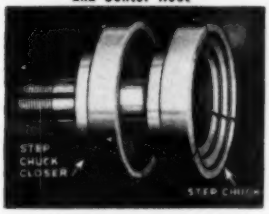
Square Turret Tool Block


Handlever Double Tool Cross Slide

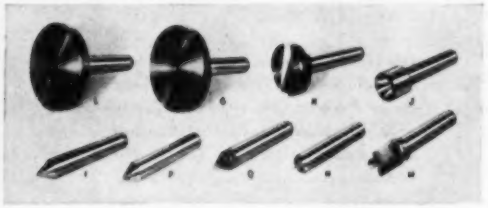

Telescoping Jaw Follower Rest and Center Rest

Collet Rack

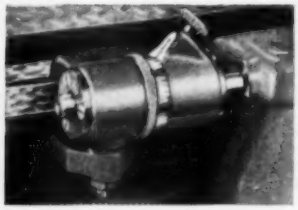
Steel and Brass Collets



Step Chucks and Closers


Centers and Drill Pads

Thread Dial Indicator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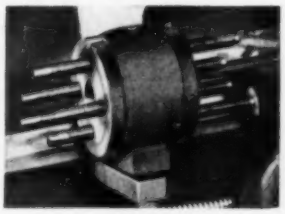
Four Position Carriage Stop

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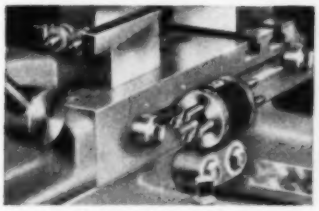
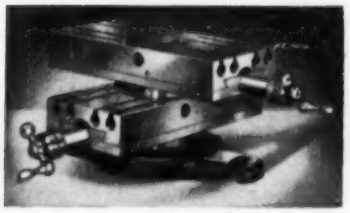
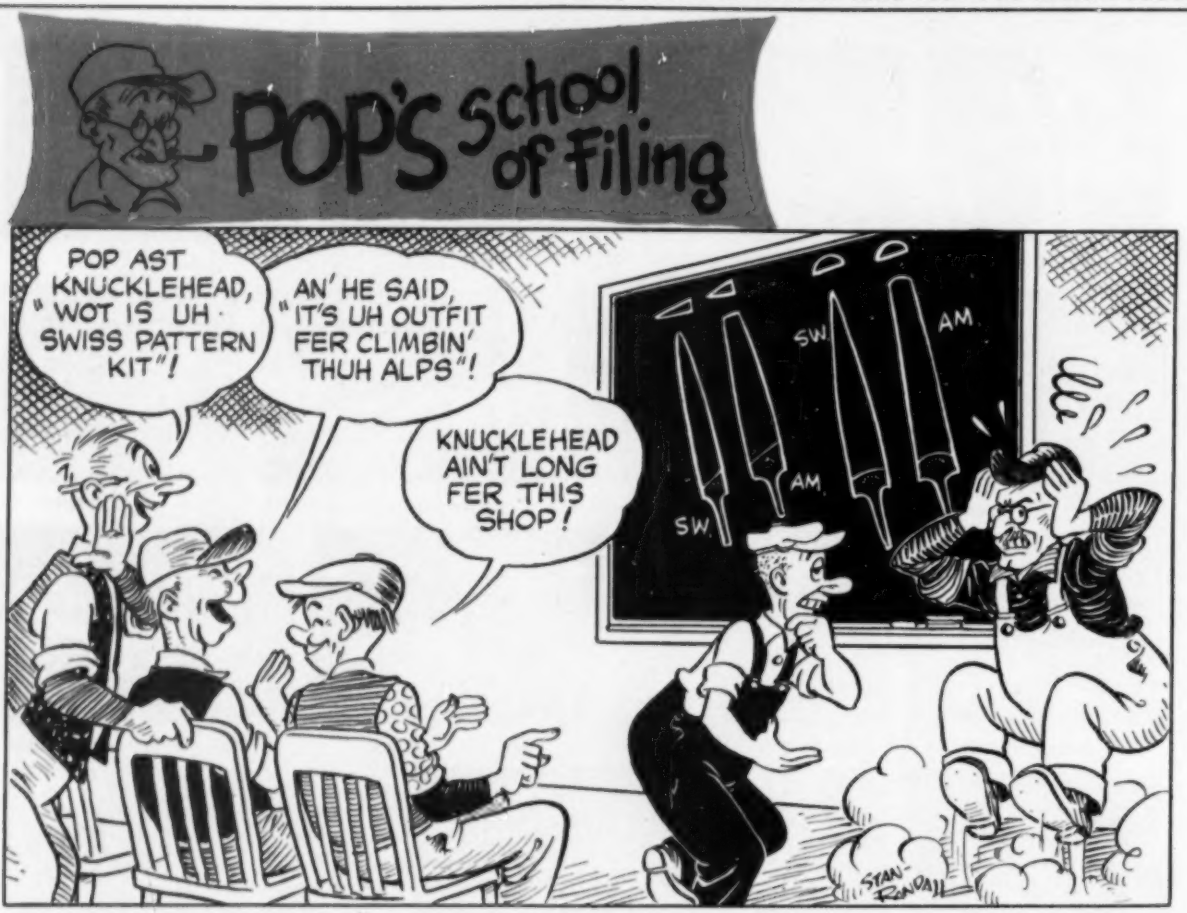

Four Position Cross Slide Stop

Safety and Standard Lathe Dogs

Coolant Pump


Universal Table



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DECEMBER
1953

VOL. 42 NO. 10

INDUSTRIAL ARTS and VOCATIONAL EDUCATION

The Shop Teachers' Professional Magazine

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This Month's Cover

Dr. Louis V. Newkirk, director, division of industrial arts, Chicago Public Schools, Chicago, Ill., was kind enough to write the article, "Industrial Arts in Chicago," which appeared in last month's issue of this magazine.

With this article he sent a number of photographs, among which was the one that appears as our cover picture for this, the last number for 1953, and which shows a high school student who is decorating a wall plaque in one of Chicago's Industrial-Arts Laboratories.

Please Note!

This is the last issue of Volume 42 of INDUSTRIAL ARTS AND VOCATIONAL EDUCATION. If you wish to have an annual index for it, please write to our circulation department and get your name on the list. A copy of the index will then be sent to you just as soon as it is released by our print shop.

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Editorial Contributions. — The Editor invites contributions bearing upon Industrial Arts, Vocational Education, and related subjects. Manuscripts, drawings, projects, news, etc., should be sent to the Publication Office in Milwaukee. Contributions are paid for upon publication. In all cases manuscripts should be accompanied by full return postage.

Articles Indexed. — The articles contained in the Magazine are regularly indexed in "The Readers' Guide to Periodical Literature," and "Education Index."

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ASSOCIATION NEWS

COMING CONVENTIONS

Nov. 23. American Technical Education Association, at Hilton Hotel, Chicago, Ill. Secretary, Frank J. Coyle, 32 Spring St., Springfield, Mass.

Nov. 23–27. American Vocational Association, at Conrad Hilton Hotel, Chicago, Ill. Secretary, Dr. M. D. Mobley, 1010 Vermont Ave. N.W., Washington 5, D. C.

Dec. 26–31. American Association for Advancement of Science, at Boston, Mass. Secretary, Raymond L. Taylor, 1515 Massachusetts Ave. N.W., Washington 5, D. C.

WEST VIRGINIA INDUSTRIAL ARTS ASSOCIATION

Dr. G. Harold Silvius, professor of industrial-arts education at Wayne University, was the principal speaker on Saturday, October 17, at the annual meeting of the West Virginia Industrial Arts Association held at the West Virginia Institute of Technology in Montgomery.

The program for the all-day meeting got under way at 9:00 a.m., with the registration of the visitors. This was followed by demonstrations which were led by college personnel. Dr. Silvius also spoke at a luncheon-business meeting.

The evening session featured another talk by Dr. Silvius at the dinner meeting at which time Epsilon Pi Tau, the honorary industrial-arts fraternity, served as host.

Dr. Silvius has served the greater part of his industrial-arts career in Detroit, Mich., where he has been teacher, supervisor, teacher critic, author, and college department head. He is a well-known contributor to professional magazines and author of *Teaching Successfully the Industrial Arts, Safe Work Practice in Woodwork,* and *A Course of Study Construction.*

♦ The Missouri Industrial Education Association's annual spring conference will be held at the University of Missouri, in Columbia, Mo., on April 16 and 17, 1954.

♦ The first program for Zeta Chapter of the Epsilon Pi Tau fraternity, Northern Illinois State Teachers College, DeKalb, Ill., was a dinner program sponsored by the members of the Department of Industrial Arts at New Trier Township High School in Winnetka.

This program was held in the high school cafeteria at six o'clock Friday evening, November 6, 1953.

The program included some outstanding colored slides by Orville A. Oaks, and a talk by Dr. John R. Ludington, specialist in industrial arts, Office of Education, Washington, D. C.

♦ The North Carolina Industrial Arts Association plans to hold its fall meeting on November 14 in Asheboro, N. C.

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Personal News

DR. J. LYMAN GOLDSMITH APPOINTED DIRECTING SUPERVISOR OF AGRICULTURE, VOCATIONAL AND INDUSTRIAL ARTS EDUCATION OF LOS ANGELES

The Los Angeles city board of education at its weekly meeting announced the appointment of J. Lyman Goldsmith as directing supervisor

Dr. J. Lyman Goldsmith

of agriculture, vocational and industrial arts education in the division of instructional services following the retirement of Claude E. Nihart.

Mr. Goldsmith is well known locally and nationally for his leadership and service in the field of vocational and industrial arts education.

(Continued on page 6A)

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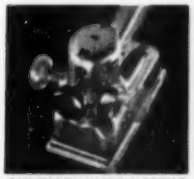

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PERSONAL NEWS

(Continued from page 4A)

Prior to his new appointment, Dr. Goldsmith supervised the junior high school industrial arts program which is the largest in the country.

Mr. Goldsmith is not only an educator, but also an outstanding craftsman and has worked on various levels of teaching and supervision, having taught at Bret Harte Junior High School from 1936–41. In September of 1941, he was appointed assistant supervisor in elementary industrial arts for junior high and senior high schools. From 1945–47, he served as supervisor of industrial arts for elementary schools. In 1947, he became the new supervisor for junior high schools, and has served in this position until his present appointment.

Mr. Goldsmith's interest in industrial arts does not stop here as he has been very active in all organizations, local, state, and national in addition to conducting the industrial arts program for the University of Southern California.

We wish him continued success crowned by vigorous health in his new position.

B. C. HUCKELBERRY DIES

The death of B. C. Huckelberry on June 15, 1953, brought to a close a teaching career in industrial education which began in the small Oklahoma town of Knowles where he began the manual training work in September, 1913.

Bert Carl Huckelberry was born in Eldon, Iowa, March 10, 1888. He attended grade school there, but as soon as he was old enough, he began working as a carpenter's apprentice under his father. When the family moved to western Oklahoma, Bert entered the high school department of the Panhandle Agricultural Institute (Panhandle A. and M. College, Goodwell). He completed the work for a B.S. degree at the Oklahoma A. and M. College, Stillwater.

After beginning the manual training in Knowles in 1913, where he taught two years, he taught in Texhoma High School until 1916. Then he entered the armed services and served in the 36th Division during World War I. Following the war, he remained for some time in France and attended the University of Lyon. Returning to the United States in 1919, he introduced industrial arts in the Chandler, Okla., high school. In the fall of 1922, he took over the industrial education work at Connors State Agricultural College where he remained in active charge of the work until a few weeks before his death.

He was a man of many interests and talents. He coached football, baseball, basketball, and track. In addition to teaching shopwork and drafting, he taught vegetable gardening and mathematics. He was a scout master, a band leader, and played first violin in a string band for a number of years. He always seemed ready for a hunting or fishing trip.

He will be greatly missed by his many students, friends, and neighbors. A teacher and friend gone to his reward.

DR. LEE M. THURSTON DIES

Dr. Lee M. Thurston, who took office as U. S. Commissioner of Education on July 2, 1953, died suddenly of a heart attack in Washington, D. C., recently.

♦ MARSHALL L. SCHMITT was granted the doctor of education degree in industrial-arts education at the August 8, 1953, summer session commencement exercises at Pennsylvania State College. The subject of his dissertation was "A Study to Determine Course Content in Consumer Education for Industrial Arts Based on Selected Durable Goods."

Dr. Schmitt has been on the staff of the industrial-arts department at North Carolina State College as Associate Professor since January, 1948. He received his master's degree from Ohio State University, Columbus, Ohio, and his A.B. degree from the State Teachers College, Oswego, N. Y.

♦ DR. EDWARD K. HANKIN, formerly associate professor of education, vocational teacher, Education Department, University of Pennsylvania, has been appointed professor of education and head of trade and industrial education at Florida State University, Tallahassee, Fla.

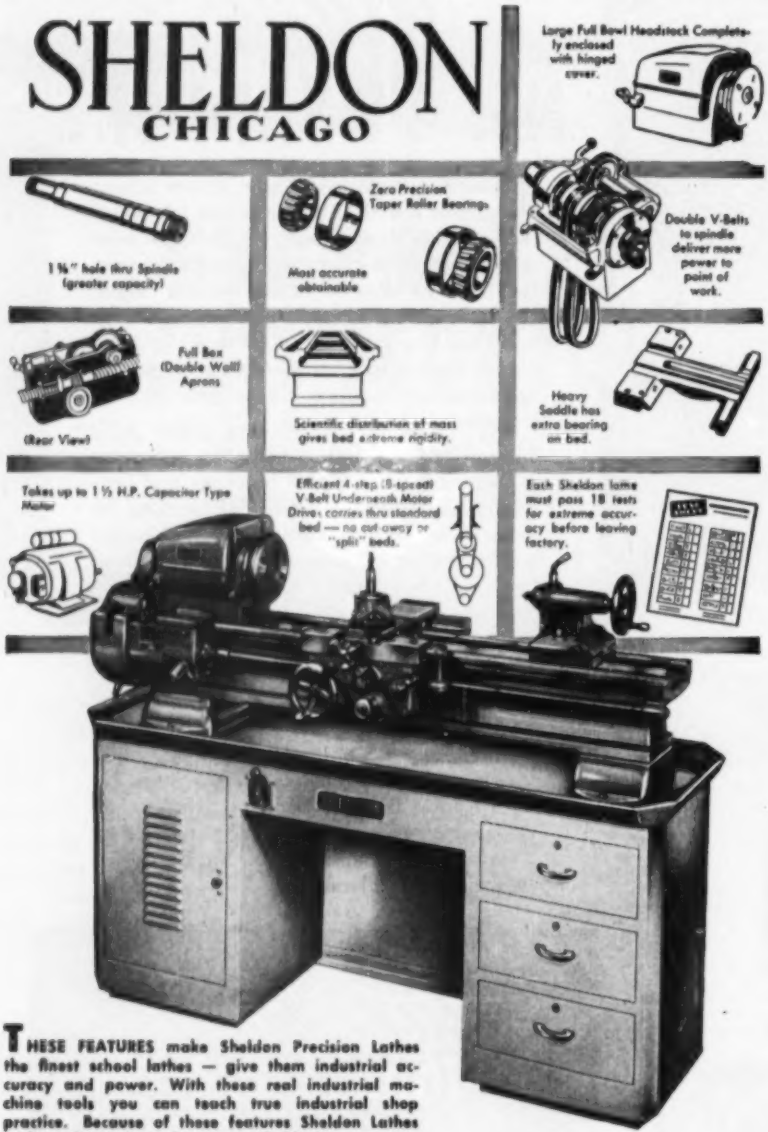
♦ JOHN R. PLENKE, JR., Wisconsin Rapids, Wis., was appointed supervisor of Trade and Industrial Education, State Board of Vocational and Adult Education, effective September 1 of this year.

During the past 13 years he has been employed as trades teacher at the Wisconsin Rapids School of Vocational and Adult Education. During the past several summers he has been attending The Stout Institute and is nearing the completion of his M.S. degree from there.

The new supervisor replaces R. L. Welch, former Stout Institute faculty member, who held the position for a number of years. Mr. Welch is now professor of vocational education at Florida State University, Tallahassee, Fla.

(Continued on page 8A)

SHELDON
CHICAGO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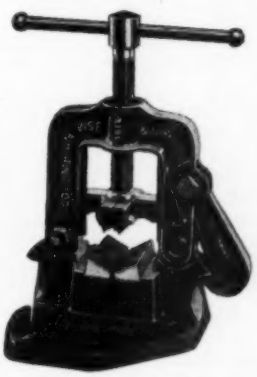

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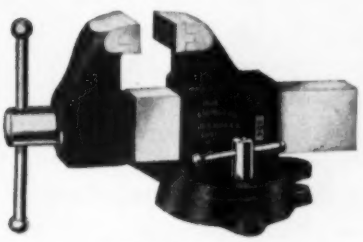

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WOODWORKERS' VISES

there is a COLUMBIAN VISE for every need and purpose...

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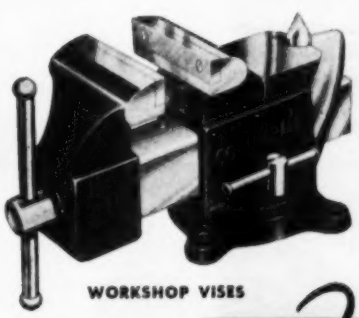
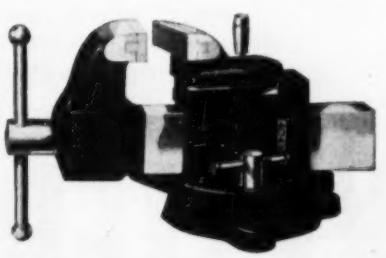


WORKSHOP VISES



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PERSONAL NEWS

(Continued from page 6A)

♦ CHARLES H. PARKER, radio and television instructor at San Diego, Calif., Vocational School, was cited Man of the Year for outstanding service in the television industry in San Diego, and awarded on honorary life membership in the San Diego County Electronics Association.

♦ WILLIAM H. HOLLOWAY, for the past 15 years vocational agriculture instructor at the High School, Lakeview, Ore., has left for Pakistan to serve on the technical co-operation mission of the Foreign Operations Administration as an extension specialist.

♦ MORTIMER C. RITTER, 61, a pioneer in the movement to educate New York's youth for the needle trades, died on October 16, 1953, after a long illness.

Mr. Ritter was the founder and first principal of Central High School of the Needle Trades, and a leading backer and first president of the two-year community college, the Fashion Institute of Technology.

Originally a designer of men's clothing, he became a teacher of garment design in 1920. Six years later the board of education assigned him to organize the needle trades high school, which he started in a loft on 31st Street.

With the help of the clothing industry, the modern 10-story building now at 225 W. 24th St. was completed in 1940.

Mr. Ritter was a leading backer of plans for an advanced school of fashion and design which led to the opening in 1944 of the Fashion Institute.

He served as its director from then until he became its first president in 1951 after it was incorporated into the State University of New York.

He leaves a wife and a daughter.

♦ JOHN C. TRANBARGER, associate professor of industrial education at Indiana State Teachers college, Terre Haute, Ind., retired recently after thirty years of service.

He came to Indiana State in 1925. Since then he has been in charge of the Teachers College Press and of the instructional program in printing. He learned his printing by working at the trade.

Mr. Tranbarger attended Marion College, and secured both his B.S. and M.S. degrees at Indiana State. He then did graduate work at Indiana University.

Before he came to Indiana State he taught at Forest, Montezuma, Mt. Ayr, and Wheatfield.

His many friends and associates hope that his leisure will bring to him the same pleasure and enjoyment that he derived from his teaching.

♦ CAPT. ROBERT W. INNIS recently received a four-year assignment as assistant professor of air science and tactics at the Michigan State College, East Lansing, Mich.

During the past year, Capt. Innis served as on-the-job training supervisor at the Mihi Air Force Base, Honshu, Japan.

Since his return to the states, he has completed the academic instructor course of the Air Command and Staff School, Maxwell, Ala.

♦ DR. ROBERT A. HARDIN is again the chairman of the Department of Industrial Education at the University of Oklahoma, Norman, Okla. Under the system of rotating this responsibility, F. Lowell Jackson was the department head during the past few years.

Eight Tray-Top Cintilathes at Des Moines Technical High School, Des Moines, Iowa

why top schools are turning to Tray-Tops

Tray-Top Cintilathes represent a new idea in light duty engine lathes: could an all geared head with 12 spindle speeds, large spindle mounted in three anti-friction bearings, totally enclosed quick change gear box, double walled one-piece apron, flame hardened transmission gears, direct reading speed selection, and other "high priced lathe" features be built into a genuinely low cost machine? Cincinnati Lathe and Tool Co., with advanced design skills and top-notch manufacturing facilities proved it could be done. That is why more and more forward-looking vocational schools are buying Tray-Tops. Swing sizes: 10", 12½", 15" and 18". (Flame hardened bedways available.)

Write for our latest catalog and list of schools in your area which have purchased Tray-Tops.

best buys in their class!

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CINCINNATI LATHE & TOOL CO., CINCINNATI 9, OHIO, U. S. A.

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YEAR
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No. 8 Jack Plane. 14" long, 2" blade. For vocational and high school students.
No. 5¼ Junior Jack Plane. 11½" long, 1⅜" blade. For Junior High School Students.
No. 118 "Boyproof" All Steel Block Plane. Made in three parts: cap, cutter, and bottom complete with locked-in adjustment. 6" long, 1⅜" blade, low cutting angle.
Specify STANLEY and be sure-

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Give your students the planes that stand up best in your school shop. Specify Stanley Planes on your next tool requisition.

Simplify Teaching With STANLEY TOOL GUIDES . . .

In 38 illustrated charts are all the important facts about common woodworking tools. Charts are perforated and punched for 3-ring notebooks. Single copies are 25c in the U.S. Ten or more, 15c each. In Canada, 25c each. Prices cover postage.

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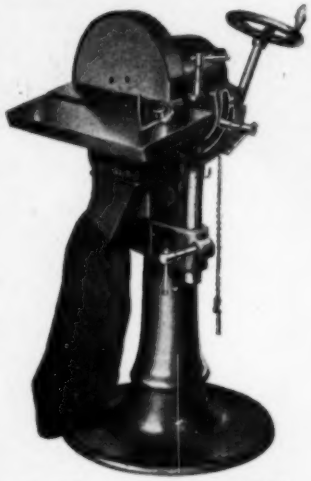
Let this low-cost "Oliver" Disk Sander help your students do their best work



Every student in your shop needs this machine for straight line sanding, and for fitting small pieces in cabinet work. In many shops it is also used for grinding and finishing light metals.

This handy "Oliver" has a 15-inch disk, with a table that tilts 45° down, 25° up. Two gauges enable you to handle angular and circular work without fuss. Its angle adjustments have accurate graduations.

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SPEEDS 50 to 4500 SFM

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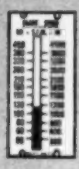
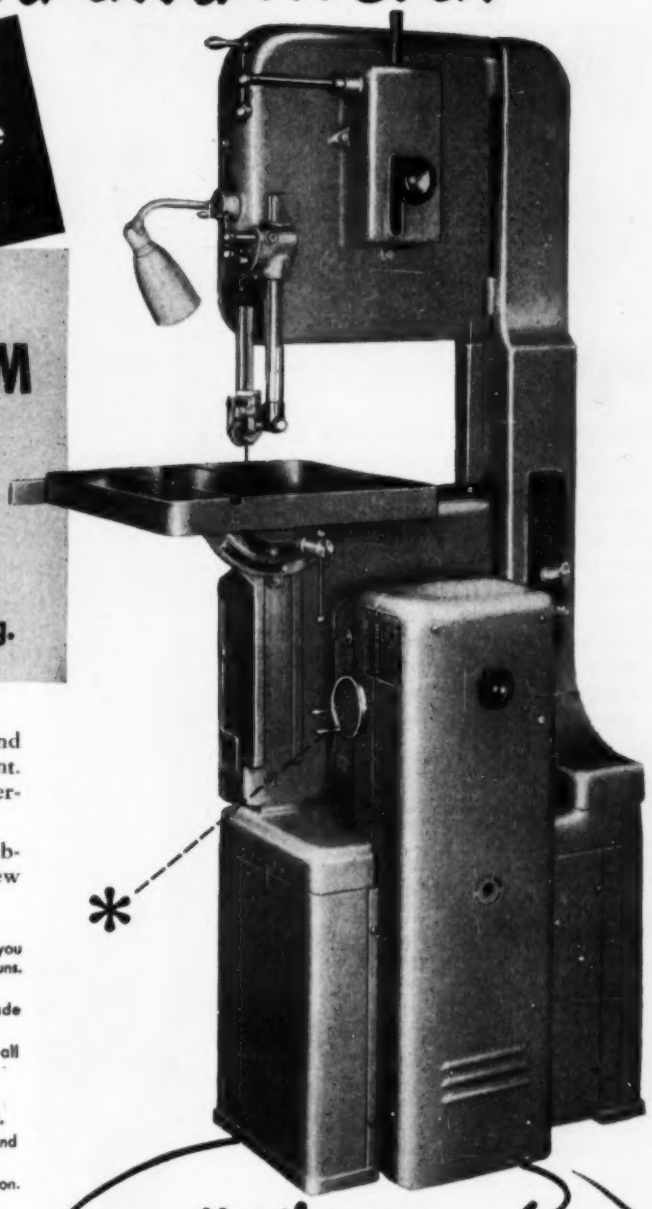


to speed wanted

...while saw runs.

No belt or pully changing.



No longer do you need to tie up funds in *two* band saws to get both wood and metal cutting equipment. This new Walker-Turner *Light-Heavyweight* is a perfect answer for *both!*

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***Quick-change Variable Speed Drive.** As easily as dialing a radio, you turn the hand wheel and change blade speed *smoothly*, while machine runs. Speed shows on a graduated scale.

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"Blue-Point Supreme"

Open End WRENCHES

For jobs like this — or where nuts are set in recesses too narrow for other types of wrenches—Snap-on open end wrenches are the strongest, safest made. Every detail of design—the tough alloy steel—precision machining — heat treatment and finishing — are highest quality. Training your students with Snap-on wrenches gives them added confidence and competence when they step from school roll to pay roll.

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21 WRENCH SET

in kit as illustrated. Contains all standard sizes, ¼" to 1⅛" Most sizes duplicated on different handles to meet requirements of many jobs.

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*Snap-on is the trademark of Snap-on Tools Corporation

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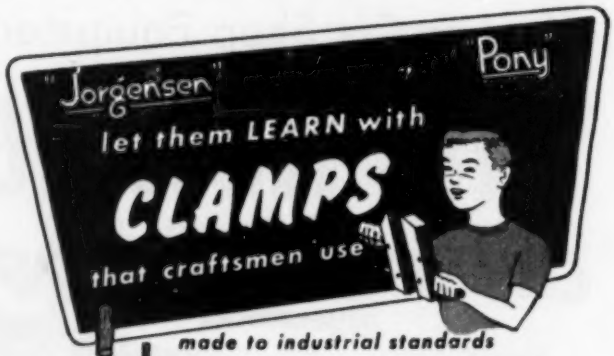

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Steel spindles—properly seasoned hard maple jaws. A wood working tool that is a "must" for proper training.

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Adjusts instantly to the work for faster operation. A real improvement over older types.

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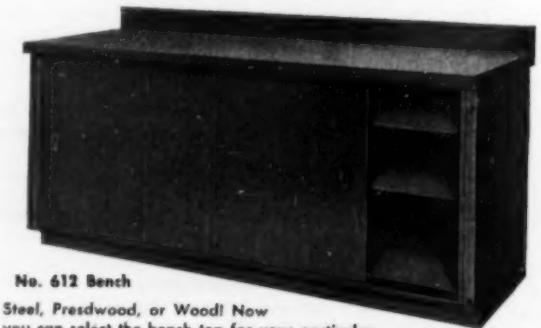

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Steel, Presdwood, or Wood! Now you can select the bench top for your particular shop application. This durable, all steel Cabinet-Work Bench is available with either a steel top, a masonite tempered presdwood-covered steel top, or a 1¾" or 2⅜" thick laminated maple top.

Roomy cabinet-type base has two adjustable shelves and is equipped with glide-easy sliding doors with lock. Bench is available 4', 5', or 6' long; 24" or 30" deep. Send for an individual quotation TODAY, and ask for Industrial Arts Equipment Catalog.

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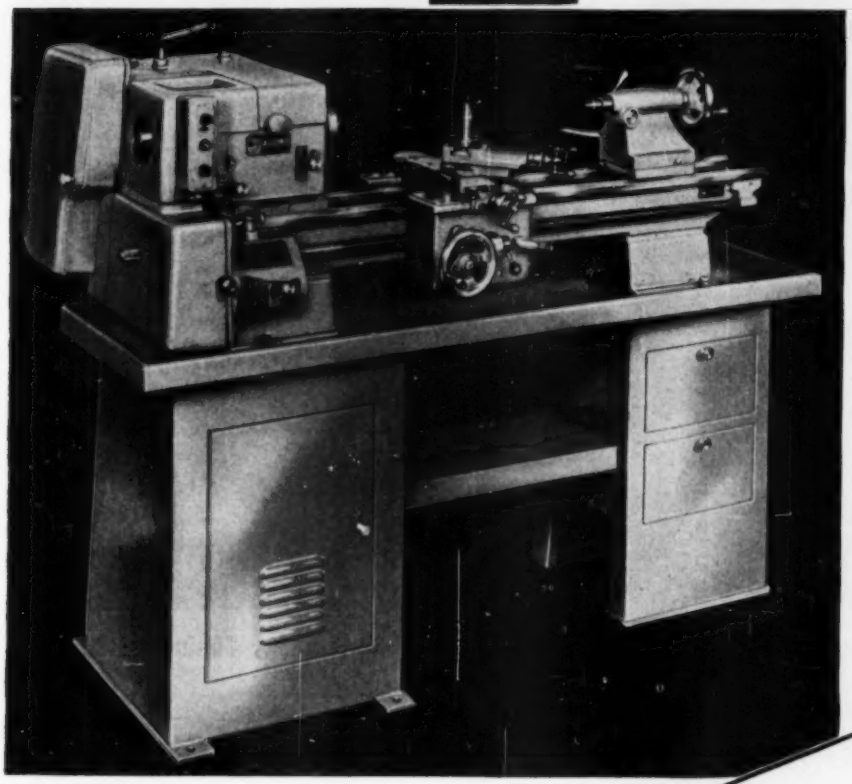

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"ZERO-PRECISION" TIMKEN TAPERED ROLLER BEARINGS, AND EXCLUSIVE FRICTION CLUTCH AND BRAKE COUNTERSHAFT = GREATER ACCURACY . . . SERVICE . . . SAFETY!

The brilliant new CLAUSING 5300 gives teachers and students more *Plus Value* features than have ever before been available in a lathe . . . at or near its price!

CAPACITY PLUS! 12" swing + 1⅜" hole + 2¼"-8 thread spindle nose + 1" collet capacity + heavy duty No. 3 MT tailstock with tang socket + 12 speeds, 29 to 1300 RPM + instant selection 48 threads or feeds = Wider Work Range!

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New Pedestal Base and Pedestal Cabinets are ¼" steel plate, welded and braced, rigid foundations for accurate lathe work. Pedestal cabinet illustrated . . . pedestal base has plain tailstock pedestal. The New Clausing 5300 is easier to use . . . easier to teach with. See it at your Atlas Clausing dealer's.

1. **BIG SPINDLE — "ZERO-PRECISION" BEARINGS** Precision ground, forged steel spindle turns on widely spaced heavy-duty Timken "Zero-Precision" tapered roller bearings — bearing run-out tolerance is .00015.
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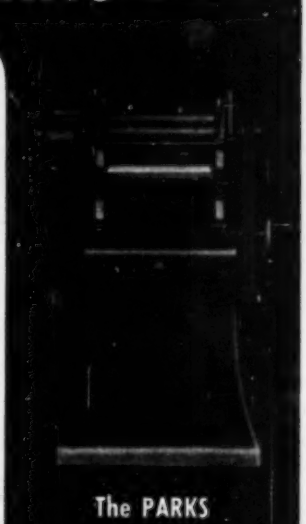

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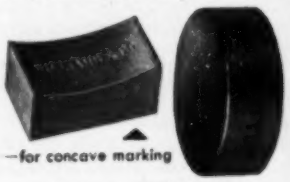

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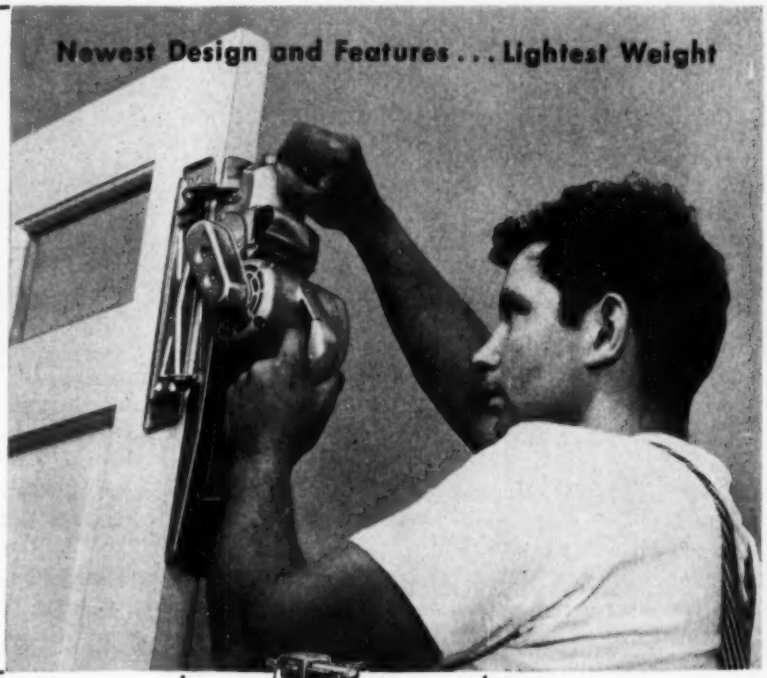
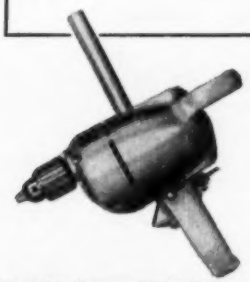
Answers All Needs for High Speed Edge and Surface Planing

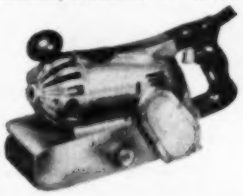
Here's why the SKIL Electric Plane is ideal for all training and maintenance needs. The cog-belt drive requires no lubrication—important where *many* people use a tool and depend on others for maintenance. Subject to abuse and inexpert operation by students, the plane is easily and quickly sharpened by an accessory device. Weighing a third less than comparable planes, the SKIL Plane is easier to use—for students, instructors and maintenance men. Sturdy construction with ball bearings throughout. Speed of cutter head: 13,500 r.p.m.

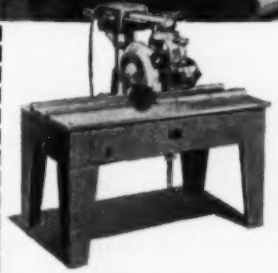




The Wide Range of SKIL Drills—26 Models—Assures the Exact Power and Capacity for all School Needs. Capacities up to 1" in steel, 2" in hardwood. Motors are reserve-powered, ideally balanced for easier use by the student or professional. Optional speeds. Many reversible models. Complete line of accessories.

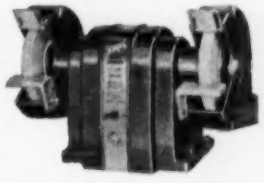
SKIL Belt Sanders for Fast Finishing at Lowest Cost. Here is the opportunity to train students with one of the most popular tools for rough or fine sanding of wood, metal, stone, composition and other materials. Wide choice of belt sizes from 2¼" to 4½". Belt speeds from 600 to 1300 feet per minute. Belts centered by convenient adjusting knob. Automatically tensioned. Five models.





SKIL Radial Saws are the *safest* tool of this type. Controls are in *front*. Retractable arm clears work area. The sturdy blade guard adjusts easily. Controls recessed to prevent accidental starting. 2, 3 and 5 h.p., with 14" and 16" blades, 1 or 3 phase, all voltages, manual or magnetic control.

New SKIL 6" Bench Grinder—Model 246. Indispensable for training and maintenance of tools. New safety pilot light—an exclusive SKIL feature—prevents accidents where many people (students) operate this tool. Sturdy construction, sealed ball bearings for dependable performance. Students learn with tool they'll use as professionals. SKIL Bench Grinders available in six models.



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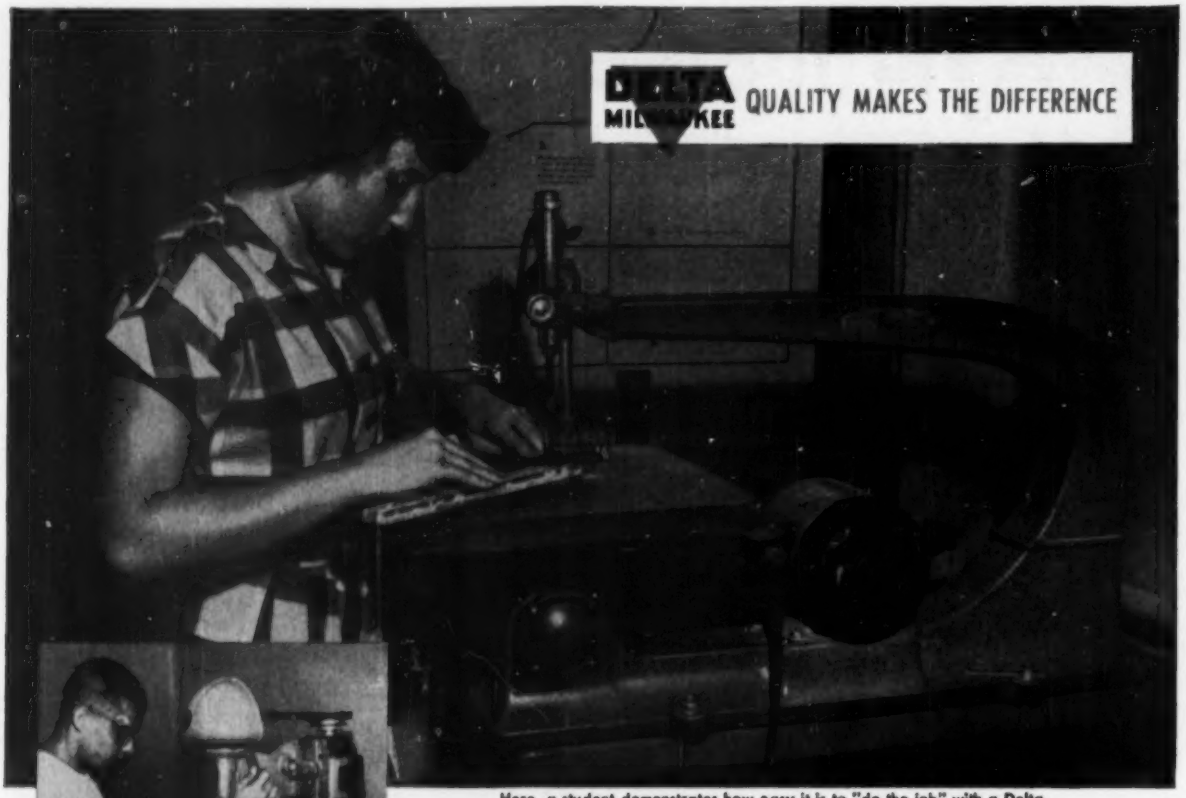

Here a student demonstrates how easy it is to "do the job" with a Delta

The Delta Drill Press has more than demonstrated its worth in Shortridge plastics classes

Girls keep up with boys in my shop classes because DELTA TOOLS ARE SO EASY TO OPERATE...

—says Mr. Gordon Johnson, Industrial Arts Instructor, Shortridge High School, Indianapolis, Indiana

Shortridge High School has gained an enviable reputation with its shop work in plastics, and Mr. Johnson gives a large share of the credit to the Delta Power Tools with which his shop is equipped. Items made by Shortridge students won "First" and "Second" and four honorable mentions in the Plasticraft division of the National Industrial Arts competition, sponsored by the Ford Motor Co.—and have been on display at the Museum of Science and Industry in Chicago.

Only about three years ago, hardly a student at Shortridge knew of Plasticraft. Aggressive Mr. Johnson started the ball rolling with a $25.00 investment in plastics, and a Delta Scroll Saw installed in the industrial arts shop. As interest in Plasticraft grew from one class, to eight periods of instruction, a Delta Lathe and a Delta Drill Press were added.

"A great many people don't realize it," stated Mr. Johnson, "but girls are just as keen about shop-work as are boys. Because Delta Tools are so easy to operate, the girls step right up and saw, bore and turn to keep right up with the boys."

Whether your classes are in plastics, woodworking or metal working, you, too, will find that for ease of operation, built-in accuracy, safety and quality construction, Delta tools are your best investment. Ask your Delta dealer for complete information today.

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INDUSTRIAL ARTS and VOCATIONAL EDUCATION
The Shop Teachers' Professional Magazine

DECEMBER 1953

Civilian Educators Help Train Naval Officers

HOMER C. ROSE

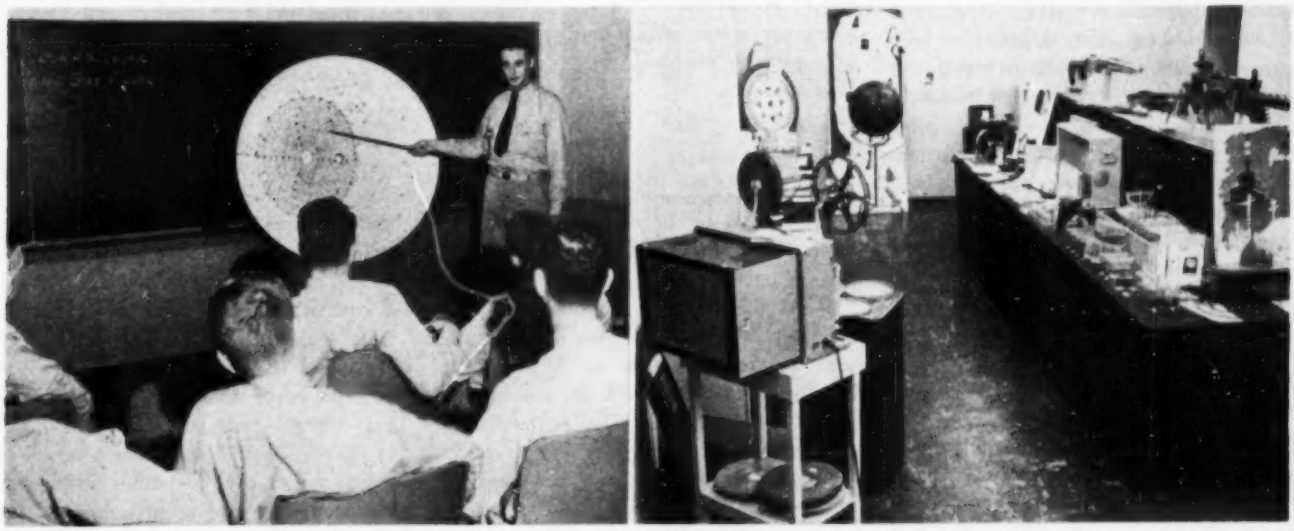
Senior Educational Adviser
Standards & Curriculum Branch
Bureau of Naval Personnel
Washington 25, D. C.

Each year approximately 140 naval and marine corps officers are assigned as professors of naval science or as instructors to the 52 colleges and universities providing naval and marine corps officer training. These officers are highly competent in such military subjects as navigation and naval engineering which they will be called upon to teach in the naval science departments, but most of them have not had experience as college instructors and need an introduction to the college teaching job and some practice in classroom teaching. To meet this need the navy, in co-operation with Northwestern University, conducts a special orientation course each year during the month of July.

The course covers the following four groups of subjects: *functional speech, naval reserve officers training corps administrative procedures, educational psychology,* and *educational procedures.*

Functional speech instruction is provided by the staff of the Speech Education Department of Northwestern University. For the speech work the large group is divided into several sections so that officers with similar speech requirements meet in the same class. For example, speech training for professors of naval science who may be called upon to make talks before the public is slightly different from the speech classes for officers with heavy teaching assignments.

Administrative procedures instruction is given by officers who have had experience with the administrative problems of



At left: LTJG H. Scudder, assigned to the University of Illinois, presents a practice lesson in navigation using a Rude Star Finder Mockup; at right: a training aids workshop is set up each year to acquaint instructors with the aids used in teaching Naval Science

NROTC units. The course includes such things as public relations, enrollment and disenrollment of students, regulations governing students under naval contract, and the problems of supervision and improvement of instruction within their departments.

Educational psychology is a lecture course given to the entire group and taught by a member of the psychology department of Northwestern University. The course is designed to cover the essential conditions of learning, the development of fundamental attitudes, and the methods that may be used in controlling human behavior. Information is presented concerning individual differences, basic human needs, the effect of leadership, the factor of personality, and the psychological problems in communicating ideas.

Educational procedures instruction consists of conferences on methods of teaching, training aids utilization, testing, and lesson planning. For this instruction the larger group of approximately 140 officers is divided into seven sections. Professors of naval science (captains, USN; or colonels, USMC) participate along with the junior officers who will be instructors. It is believed that through this experience they gain desirable perspective on teaching which will be useful to them as supervisors. Practice teaching is emphasized and during the practice teaching schedule the groups are again divided, making a total of 14, to provide for maximum participation. Practice lessons are analyzed and evaluated by members of the class using a check-off list especially designed for each type of lesson. Officers have found this part of the course most valuable and have each year requested more time for practice teaching in their written evaluations of the orientation conference.

In selecting the staff for the educational procedures course the following factors are considered:

a) Experience in teaching subjects of a technical nature similar to navy subjects.

b) Instructor training experience with the armed forces.

c) Military experience during wartime.

d) Administrative experience in training programs.

e) Reputation as teacher and as a leader. The program has been in effect for seven consecutive summers. Plans for the 1954 program are being made now.

Educational procedures staff for NROTC Conference

Left to right: Burton Wright, educational specialist, Headquarters, U. S. Marine Corps, Washington, D. C.; Homer C. Rose, senior educational advisor, Standards & Curriculum Branch, Bureau of Naval Personnel, Washington, D. C.; Lawrence Braaten, training aids specialist, Bureau of Naval Personnel, Washington, D. C.; Robert W. English, director of education, American Institute of Baking, Chicago, Ill., and formerly professor of education, Southern Illinois University; James F. Peterman, educational specialist, U. S. Naval Examining Center, Great Lakes, Ill.; Harry Pederson, director of industrial arts division, State College, Platteville, Wis.; Vernon C. Gresham, educational specialist, Bureau of Naval Personnel, Washington D. C.; Rupert N. Evans, associate professor of education, University of Illinois; Edward C. Estabrooke, secretary and educational director, American School, Chicago, Ill.; J. C. Lang, educational specialist, Bureau of Naval Personnel, Washington, D. C.; and Ray Trimble, training aids specialist, Training Aids Center, Great Lakes, Ill.

The Industrial-Arts Teacher and Guidance

ROY A. LINDBERG
Instructor in Mechanical Engineering
University of Wisconsin
Madison, Wis.

Classroom Guidance

Until more recent years the classroom teacher did not consider himself an important part of the guidance program. It was on the basic assumption that this attitude still prevails among many industrial-arts teachers that an inquiry was launched into the subject. An answer was sought to the question, What responsibility does the industrial-arts teacher accept in seeking to further the guidance program of the school?

Certainly much guidance has always been done in the industrial-arts shop whether it has been labeled as such or not. We were concerned in this inquiry, however, with a definite conscious effort made by the shop teacher in co-operation with the school guidance program.

Source of Information

To get a picture of the industrial-arts teachers' contributions to the field of guidance and some reaction to the shop curriculum, it was decided to go to the one who had been on the receiving end, namely the students themselves.

The students selected for the inquiry consisted of 185 former shop students who also represented nearly as many schools. Their average time since graduation was five years. This afforded them a period of time to reflect over and thus make some conclusions as to the relative value of the industrial-arts curriculum and the shop teachers' techniques in applying guidance values.

Students' Reactions to the Use of Guidance in the Shop

Former industrial-arts students were contacted during the academic years 1948 and 1949 and their reaction to the guidance values of the shop are given as follows:

1. Guidance was not given by the shop instructor in 80 per cent of the cases.
2. As to the guidance values of the courses themselves:
   a) No guidance value, 35 per cent
   b) Of benefit in awakening an interest in subjects covered in the shop, 20 per cent
   c) Of benefit in discouraging ill-founded interests in subjects covered in shop, 5 per cent
   d) Undecided, 40 per cent

The former shop students further stated that they found the shop courses taken in high school proved useful to them in the following ways:

1. As a hobby
2. In making repairs and construction
3. In college courses
4. In part-time jobs
5. In full-time jobs

The 20 per cent of the students who felt that they had received definite guidance at the hands of the industrial-arts teacher gave the following methods as being employed:

1. Movies
2. Representatives from the trades brought to the classroom
3. Shop field trips
4. Talks by the instructor

Instructors' Views of the Use of Guidance in the Shop

Having obtained the students' viewpoint on the use of guidance by the industrial-arts teachers and curriculum it was decided to make a similar inquiry of the teachers to obtain their viewpoint also. The inquiry was made of 80 shop teachers in Minnesota and Wisconsin. The results showed guidance tools being used common to all. The illustration shows the various techniques used and the approximate percentage of the group using it.

There may be a reasonable doubt as to 92 per cent of the shop instructors making use of movies and also pointing out the particular guidance values found in them. This may also apply to bulletin boards and film strips.

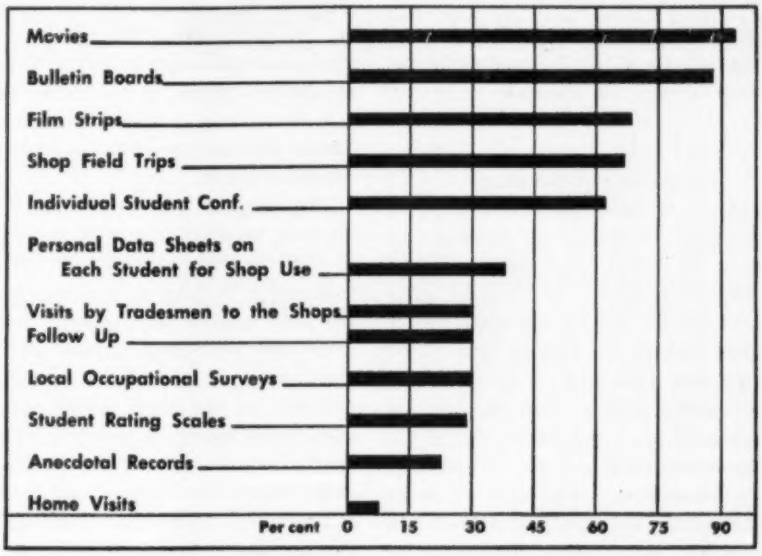


Fig. 1. Methods and use of guidance in industrial-arts shops. Original size 6¼ by 4⅜ in.

This limited sampling of information on the techniques of guidance employed by the shop teachers would make it appear that more of the tools of guidance were used than the students were conscious of. The students questioned, however, were five years out of high school. The improvement in the use of guidance over this period and the proneness of the teachers to overestimate what is being put forth and the students to minimize it would account for some of the discrepancies between the results of the two inquiries.

The fact that many guidance techniques suitable for the shop are not used is evident from both students' and instructors' reports.

Reasons Given for Not Using Guidance in the Shop

Listed below are the reasons as given by the shop instructors for not making a more definite contribution to the guidance program. The reasons are listed in rank order with the most frequent cause listed first.

1. Guidance in the school is done by:
   a) A full-time counselor.
   b) The home-room teacher.
   c) Church school, one day a week.
2. Insufficient time plus large classes.
3. Crowded conditions and equipment not available.
4. Instructor does not feel qualified.
5. Superintendent and community not in sympathy with or not educated to the use of guidance.
6. It costs too much for tests and records.
7. It looks good in the newspaper but is otherwise meaningless.

Various Methods of Guidance Employed by Shop Teachers

On the brighter side we found the following methods of guidance being used by the instructors that were not listed in the original inquiry.

1. A shop library is kept on job opportunities in trades and industries with time allotted for reading.
2. Class discussions of various trades.
3. Study of Parts I and IV of the Dictionary of Occupations to become familiar with the types of occupations.
4. Book reports by students on opportunities in industry.
5. Parents' Night.
6. Encouraging the student in the line of work he excels.
7. Referring the student to the proper authorities such as the personnel man or shopforeman to get in touch with persons working on the type of job he thinks he would like.
8. Short paper by the student on the type of work he thinks he would like.

Many methods of guidance are in use

by the shop teachers but it would appear, by the results of this inquiry, that many also are not aware of the possibilities for guidance through the shop and its activities.

Foundation of Guidance

Guidance is based on a knowledge of the student, his home, his abilities, his interests, his experiences, and his mental and physical make-up. In the short space of time the teacher has each student it becomes difficult to become acquainted with all these aspects of his life. It is true we can gather much subjective information about each student by observation of his habits of co-operation, neatness, accuracy, skill, thoroughness, efficiency, promptness, imagination, managing ability and many other factors that constitute the student's personality. There is, however, a body of very helpful information about each student that we cannot get by observing him in class. It is only through a knowledge of the student at school as well as at home and his various outside activities that we get to understand him. By putting forth every effort toward understanding the student we will have a foundation on which to build.

Guidance Aids and Suggestions for the Shop Teacher

In order that the shop teacher might more easily obtain a better knowledge of his students and their activities and background, the Student Shop Counseling Form was developed. This form is filled out entirely by the student with some aid from his parents perhaps. This gives the shop teacher a quick ready reference of student background. Each of the items may be expanded during interview but the aim in making this form has been to cover essential items briefly.

This Student Shop Counseling Form is intended to serve as a guide for the type of information necessary and useful if guidance is to take its proper place with the shop teacher. It has been tried out in several small high schools and found satisfactory. It can, however, easily be changed to suit local conditions. Each item on the form is intended to furnish an insight into the student's life. The items under "Home Background" will oftentimes show family relationships that will help explain the student's behavior in class. Thus each of the items in turn is intended, with a little probing, to furnish a better understanding of the student.

In order to supplement the teacher's knowledge of the student and to keep certain information more confidential the Instructor's Shop Counseling Form was developed. It contains information that tends to rate the student's several abilities. This form may be filled out by the instructor from the central office file or by the office staff. It provides still more concrete evidence of the student's likes and dislikes, his abilities and aptitudes.

The Use of the Guidance Forms

After the forms have been properly filled out, returned and placed together for each student, the instructor will find he has a body of very useful information that will aid materially in giving an insight into the life of each of his students. Having become somewhat familiar with the information on the two forms the teacher will have a basis from which to start short interviews with the students. Interviewing may seem difficult and not very worth while at first but practice supplemented with good reading material on the subject plus an earnest desire to be of help will go a long way toward making each interview worth while to both the student and instructor. Placing the interviews on a strictly voluntary basis seems to be one of the most satisfactory methods. An announcement is made to the various classes concerning the plan for interviews and their purpose. A part of the shop study period may well be devoted to short interviews. Even though students come on a voluntary basis it may be well to have a schedule ahead so that there will be ample time to look over both forms and thus have in mind some topics that can be discussed to the advantage of the particular student. The student too, will have had an opportunity to think about some points he would like to discuss.

Guidance Information Needed by the Shop Teacher

The shop teacher interested in the student's abilities will want some objective evidence to corroborate his subjective judgment. He will need to become acquainted with the types of standardized tests used

Name..... Age..... Date.....

STUDENT'S SHOP COUNSELING FORM

(Grades 9–12)

TO THE PUPIL: Please fill out this form carefully. The information recorded here will be treated confidentially and will be used to help you.

I. Home Background

1. Address..... Tel. No. .....
2. Father's occupation (specific).....
3. Father's education (grade completed).....
4. Mother's occupation before marriage.....
5. Are parents living together?.....
6. Older Brothers' Names | Age | Highest Grade Reached | Employment or Training

....

....

II. School History and Records

1. Date of entrance to this school.....year.....
2. Previous school, if any..... (school) (city) (state)
3. Subjects, not required, elected this year.....
4. Subjects, not required, elected last year.....
5. Tell why you chose these subjects.....

.....

.....

6. The subjects in which I am least interested are:.....

.....

7. The extracurricular activity I enjoy the most is.....
8. Mention any offices held in school, for example, Glee-Club President 10–11 .....

III. Outside Interests

1. What books or magazines do you read regularly?.....

.....

2. Do you expect to go to college? Yes..... No..... Undecided.....
3. In what department would you like to specialize if you go to college?

..... (Mathematics, Science, Engineering, etc.)

4. If you do not plan to go to college, do you plan to attend vocational school? .....
5. What vocation would you like to train for, other than that listed for a college course? .....
6. What would you like to be doing ten years from now?.....

.....

7. What would your parents like to have you do when you finish high school? .....
8. How did you spend your time other than working this past summer?

.....

9. What part-time jobs have you had? If you have one at the present time underline that one.....
10. No. of hours per day on present job ..... per week.....
11. What job have you liked the best? ..... Least? .....
12. If you have a workshop at home about how often do you use it?

.....

13. What special activities do you carry on during your spare time?....

.....

14. What tools or equipment do you use in connection with this activity?

.....

Student's Name .....

INSTRUCTOR'S SHOP COUNSELING FORM

1. Subject receiving highest grades ..... Lowest .....
2. Standardized tests given:

Name	Date Given	Percentile Rank	Remarks, Areas, High, Low, etc.
.....	.....	.....	.....
.....	.....	.....	.....
.....	.....	.....	.....

3. Special aptitudes and interests noted through personal observation and conversation.....
.....
4. Behavior descriptions noted by yourself and others concerning responsibility, creativeness, concern for others, influence, adjustability, seriousness of purpose, emotional stability, and other factors.....
.....
5. General Health: Good..... Fair..... Poor.....
Special considerations .....
6. Grades earned in shop:

Wood	Ceramics	Farm Shop ....
Metal	Crafts	Mech. Dr. ....
Printing	Machine Shop	Electricity ....
Auto Mech.	Welding	Others ....

in the school so that he might have a better understanding of the scores and their interpretation. The shop instructor, promoting guidance, will want to make use of aptitude tests that show potential in the manual and mechanical fields. A test of this type is the Revised Minnesota Paper Form Board Test which can be administered in 20 minutes and is easy to score. It produces evidences of ability to learn mechanical drawing and descriptive geometry and is also predictive with regard to success in mechanical work and engineering courses. Tests such as these can be highly useful in checking occupational choices made by the pupils and aiding others to find suitable fields of endeavor.

The shop teacher should also be familiar with personality traits necessary for success with a chosen occupation. By bringing these facts to the attention of the student he will enable him to examine his own traits in relation to the desired thus affording him a better basis on which to make his own judgments.

Clues to interests may be noted by the shop teacher as he observes the students in class from day to day. As any particular phase of shopwork absorbs the boy's interest it will lead him to try to find out more about it and will be expressed in his eagerness to talk about it. Thus the *real* interests may be checked with the spoken or listed interests.

In order to do a more practical job of counseling the shop teacher will want to have at hand some kind of occupational survey of the local community. In this connection he will also want specific information on what qualities and characteristics prospective employers of high school students want.

The success of the shop guidance program may be measured in part by follow-up studies. These studies will be invaluable in pointing out strengths and weaknesses of the curriculum we have offered as well as the guidance efforts that have been made. From the follow-up information we will be able to examine the results of our efforts in the light of the objectives which is the essence of good teaching.

Guidance in the industrial-arts shop then, consists of knowing and observing the student in as many phases of his life as possible, helping him interpret all the information available through experiences of various types, and in making the most satisfactory adjustment to life both for himself and society.

The Vocational-Industrial Club of Texas

LELAND B. LUCHSINGER

Specialist, Industrial Preparatory Training and State Sponsor, VIC
The University of Texas
Austin, Tex.

Leaders in the trade and industrial education field, including the chief of industrial education service and the director of industrial training, saw a vital need for some form of youth organization for students who were taking trade and industrial courses. Plans to originate such an organization were formulated in the spring of 1947. Actual organization has progressed since the school year 1947–48, resulting in an ever growing vocational industrial club of Texas. Today, VIC can boast that over 70 per cent of all the cities in the State that have trade and industrial classes have affiliated clubs.

Trade and industrial education classes

At left: A club exhibit which won first place at the annual VIC Meeting

At right: The VIC State President presenting the VIC "Outstanding Chapter Award" to the president of the winning chapter

At left: An identification contest in the metal trades. At right: A VIC member chucking up a piece of stock in the chucking and centering "Skill-Speed Contest"

are composed of students who are interested in gaining knowledge and acquiring skills in an occupation or field of related occupations which they have chosen to pursue as a future means of earning a livelihood. These classes are of two kinds. The *D. O.*, or diversified occupations class, is where planned work experiences are acquired through actual participation on a real job under the working conditions of an industrial establishment. The class is conducted through co-operative relationship of secondary school and local industry. The second kind of class is the usual *day trade*, or trade preparatory type. In a class of this kind the students spend three periods in class receiving actual practice with tools and machines in order that they may acquire the necessary basic skills. Classes of this kind are taught in auto mechanics, machine shop, building trades, metal trades, electrical trades, cosmetology, printing, drafting, photography, aeronautics, mill cabinetmaking, commercial art, radio servicing, and other subjects.

Gaining knowledge and acquiring skills are the fundamental objectives of these classes; however, other things must be considered in addition when we are aiding our youth to prepare for earning a living.

Question any industrial supervisor, personnel director, or employer of personnel in the trade and industrial field and he will inform you that skills and related technical knowledge are important, but attitudes, character, and personality are also important.

Where can an individual gain self-confidence, experience group participation and contacts, and acquire a spirit of co-operation? The activity that best answers this question is *club work*. Is there any better way for a person to learn how to shoulder a responsibility and perform a task well than to be a member of an important committee — a committee that will determine the success or failure of the entire undertaking? How can a student be given an opportunity to develop leadership characteristics in civic, social, and industrial undertakings? He develops these leadership abilities by presiding over the group, planning club activities and assisting and directing their successful completion.

A student who becomes actively engaged in club activity will be a better student in his trade and industrial education class as well as in other school subjects, because his club activities stimulate his interest in educational subjects. He sees the actual result and value derived from acquiring the skill and knowledge. He sees the resultant real value. Club participation enhances the social prestige of vocational students. The social activities of club participation aid in the development of young ladies and gentlemen. Wholesome recreation stimulates constructive undertakings of our youth and keeps them from engaging in activities which may be detrimental.

The vocational-industrial club has grown steadily since its origination. VIC has grown because it is answering a definite need of our youth. It has provided a solution to the desires of our young people to be recognized, to belong, to participate, and to enjoy wholesome activities.

This youth organization lists the development of leadership in civic, social, and industrial pursuits among its objectives. Young people are given an opportunity to assume responsibilities through committee participation regarding club activities. They receive recognition for a job well done after the activity has been successful. This is training for life. Some of our youths learn to preside over meetings which are conducted according to parliamentary procedure. They learn to voice their ideas and to respect the rights of their fellow workers. They learn to think on their feet, and are able to appear before a group and state their ideas. They have the satisfaction of knowing that they are a part of a growing, worth-while organization. Students are anxious to belong to such an organization, and are desirous of being members of a class which sponsors this club. This results in trade and industrial class enrollment above the maximum that can be accommodated in the shop wherever an active club is included in the trade and industrial curriculum.

Club activities encourage experiences in management, planning, budgeting, and spending of funds. Club members vividly remember the lessons taught in planning and management when a project is undertaken to increase the treasury. Club activity requires funds, and raising of funds requires club activity or projects. When a project is undertaken, it means assuming responsibility and performing work. When a project results in a financial loss or failure to obtain the desired goal, the club members remember the lesson learned for the remainder of their lives. Being told

various facts about planning, budgeting, and spending of funds is not nearly as effective for the teaching of financial responsibility and management as actually carrying out a business endeavor and having it be financially successful or result in a deficit that must be made up. Club work teaches that financial obligations must be met.

Teachers of T. & I. subjects who are sponsors of VIC clubs do a better job of teaching, have a more industrial atmosphere predominating in their shop or classroom, and are more closely related to and respected by their students. Who needs to motivate a student making a radio as a job to enter in state competition with other day trade preparatory students in radio classes? This student desires instruction. An instructor-sponsor can learn more about Johnny in one hour on a hay-ride-wiener roast as a club social, than he can in five hours as Mr. Instructor of the trade preparatory or D. O. class.

The Vocational-Industrial Club of Texas provides many necessary experiences for the student members. This fact is attested by the behavior changes wrought in active club members.

There is the specific case of a student who had been a leader of his fellow students in the junior high school where enrollment was average. However, upon entering a very large senior high school, he was just another student in the vast student body. He was above the average as a student, but just knocked along in a mediocre manner until entering a D. O. class and becoming a member of a vocational-industrial club. He found an organization in which he could do something he enjoyed and receive recognition for it. He assumed the responsibility of a club office and performed the job well. This led to more participation and more success. Soon other students and faculty were noting the fine work he was doing in his school work and on his training job. He entered a job, or project (as some may call it), in competition at a VIC State Convention and won first place. This resulted in publicity for the student and in the training he was receiving in his chosen occupation. He won an award for outstanding club leadership. Today he is continuing to work in this same occupation. He is continuing his education. His standard of living will perhaps be on a higher plane than was conceived possible three years previously. VIC

The club insignia

participation was instrumental in aiding this boy. His sponsor stated, "Vocational-industrial club work made (and he stated the boy's name)."

VIC is governed entirely by students. Student officers, with the aid and counsel of an advisory council, conduct the business of the club in a democratic manner. The advisory council is composed of VIC sponsors from each of the five VIC Districts, school administrators, and representatives of labor and industry.

The state of Texas is divided into five districts. These districts are similar to the teacher-trainer and district supervisor for trade and industrial education districts. The district president for each of the five VIC districts is also state vice-president. The local sponsor of the member who is elected the district president is also designated as the district sponsor.

Officers on the district, as well as the state level, are president, vice-president, secretary, treasurer, reporter, and sergeant-at-arms.

Officials of the Texas education agency, trade and industrial service, and teacher trainers from the two Texas T. & I. teacher training institutions are ex-officio members of the state chapter. These officials, plus the state sponsor, who is appointed by the ex-officio members of the state chapter, comprise the state chapter. The state chapter assists and advises local sponsors and local clubs in carrying out a well-planned local program. The state chapter also aids in district and state club programs and activities.

A district convention is held in each of the five VIC districts sometime during the fall of the school year. At this meeting, the district officers are elected (with the exception of the district president), new members attending who haven't been initiated locally are initiated, and club activity for the year for that particular district is planned. A second district convention is held in the spring of the year. At this meeting, the district president is elected to hold office the following school year, candidates are nominated who will run for state office, and all contests are conducted.

The state convention follows the district convention and is held at some centrally located city in the spring of the year. State officers are elected (with the exception of the five state vice-presidents, who are also district presidents) by the house of delegates at this convention. The house of delegates is composed of two delegates from each club. Each club has as many votes as they have paid-up members.

All of life is competition. In this respect, club-member participation in district and state convention contests runs true to life. Do you think an instructor needs to motivate a student to learn how to do a specified job on a lathe when he is aware of the possibility that his skill and knowledge will result in his receiving a tangible award and favorable recognition in district and state convention contests? Such a student is eager to learn. He is interested. He has found an activity he enjoys, and he wants to show his instructor, his classmates, industrial employers, and the public what he is able to do. He is proud of his achievements.

All the contests for VIC members are held at the state convention. Contests mean competition. Chapter contests include: exhibits, business contest (including secretaries' and treasurers' record books), publicity and scrapbook, and photo panel of the club's activities. Member contests are composed of individual member's jobs and participation contests. Individual member's jobs fall in two categories: specified jobs (which have been limited mainly to the metal trades), which are built to specifications sent out in advance by the state chapter and are normally incorporated as part of the standard course of the school, and student selected jobs, which are the jobs the student chooses to make and for which he submits his plan with the job. Participation contests include identification contests, skill-speed contests, judging contest, technical information contests, job application contests, and parliamentary procedure contest. Greatest emphasis is placed on participation contests conducted at the convention in the host school's shops. These contests are given greater student response than any other.

Students winning first place receive medals, certificates, and award ribbons. Chapter contest winners receive certificates and ribbons. A large trophy in the form of a cup is presented to the outstanding club in the state and five smaller cups are presented to the winning club in each of the five VIC districts. These awards are presented through a "point system." Points are given the club for activity during the entire school year plus convention contest participation. The club with the most points wins. Other awards presented to the Vocational-Industrial Club to be awarded by the state chapter to various contest winners have been received from business, industry, organized labor, service clubs like the Rotary clubs, Kiwanis, etc.

The state convention also includes industrial tours of high educational value to students of trade and industrial education. During the convention, a certain period of time also is devoted to recreational and social activities.

The club has a publication, "The VIC News," which is issued four times during the school year to all club members. This publication is eagerly received by members, and each issue is anxiously looked forward to.

Club members are able to display the club emblem or insignia through club stationery, notebook, and windshield stickers, decals, club pins, tie clasps, club banners, and club garments such as jackets, coveralls, and shop coats with emblem, city name, and wearer's name stitched thereon.

Any organization offering the opportunities this youth organization offers, is providing for a definite need; there is no wonder, therefore, that it is growing in popularity. The club's members of today will become Mr. and Mrs. Citizen of tomorrow.

Leaders in Industrial Education

WILLIAM T. BAWDEN

Emeritus Professor
Kansas State Teachers College
Pittsburg, Kans.

DAVID SAMUEL SNEDDEN

(Continued from page 297 of the November, 1953, issue)

A Forceful Speaker

He will always be remembered by those who heard him as one of the most forceful and vigorous speakers in the history of the movement. Personally, he was a tall man, nearly if not quite six feet in height, with broad frame and commanding presence. His face was marked by strong features. He had a powerful, arresting voice, not smooth and appealing like an orator's, somewhat sharp and rasping; and yet, somehow, agreeable and fascinating to listen to.

He always spoke with earnestness, conviction, and self-assurance; and withal he was always deadly serious. In all the public addresses I heard him deliver, and in numerous personal conversations, I do not recall that he ever told a humorous story to illustrate or reinforce a point, or, as we say, cracked a joke. For these reasons, as well as because of his method of incisive analysis and convincing manner of speaking, he impressed his listeners as one who spoke with authority.

If he sometimes seemed dogmatic in his pronouncements, if not actually pontifical, he always marshaled his facts so effectively and organized his line of argument so consistently that his conclusions seemed irrefutable. Notwithstanding the numerous occasions upon which he appeared the caustic and devastating critic, his manner of presenting his criticisms and conclusions did not invite discussion nor encourage rebuttal. I do not recall any occasion upon which a speaker successfully opposed him before an audience.

The Objects of His Criticisms

I well remember one of my early experiences, and my personal impression after listening to one of his critical addresses. Meeting him the next day, I said that I felt quite disturbed by the severity of his criticisms, which seemed to cut the ground from under some of the experiments and proposals which, up to that moment, I thought had real merit. After listening to his address, I told him I hardly knew what to think!

His reply was, in general, something to this effect: "If you now feel in doubt as to the propriety of what you have been doing or advocating, it may be because of one of two reasons: (1) you have been following a course of procedure that is not based on sound principles or that is untenable because it does not meet the conditions; or (2) you have not yet been able to think your way through to sound conclusions, so that you do not now feel sure of your ground, because you do not have all the necessary data, or have not taken adequate account of all the relevant facts. In neither case have I done any harm if I have caused you to re-examine the premises and the assumptions with which you began, and the processes of reasoning by which you have arrived where you are now."

I recall very distinctly feeling relieved, before the conclusion of our conversation, by the discovery that he had from a very early period in his career recognized the educational values of instruction in industrial arts for boys and home economics for girls. Later, I observed that, at suitable times and places, he advocated these subjects for all boys and girls, as a necessary part of general education. On one occasion, in fact, he wrote, "personally, I am a most emphatic believer in manual training,

and want to see it become universally a part of the curriculum."[2]

I recall very distinctly also my impression of Dr. Snedden as an individual somewhat less dogmatic and inflexible when we "got down to cases," and talked over some of the problems and questions with which I was then concerned.

Further Graduate Study

In the summer of 1905, Dr. Cubberley returned to Stanford University from his term of study at Teachers College, with glowing accounts of the professional progress being made at that institution. At Dr. Cubberley's suggestion, Snedden requested leave of absence and returned to Teachers College for further graduate study. Upon enrolling in Teachers College as a candidate for the Ph.D. degree, in the fall of 1905, he was offered a position as teaching assistant to Samuel T. Dutton, formerly superintendent of schools in Brookline, Mass., who had recently been appointed professor of educational administration at the College.

Four Years at Teachers College

Early in 1906 Snedden was appointed adjunct professor of school administration at Teachers College, and remained there nearly four years. One of the first notable accomplishments of this period was his collaboration with Dr. Samuel T. Dutton in the writing of a 600-page book on *Administration of Public Education in the United States*, for many years "the only comprehensive textbook and source book on school administration in this country." More than 40 years later Dr. Snedden recalled as "prophetic" one chapter which he contributed, entitled, "Vocational Education." He noted also that the final chapter, contributed jointly by the two authors, was entitled, "The School and Society."

Commissioner of Education in Massachusetts

In the fall of 1909, Dr. Snedden received a visit from Frederick P. Fish, at that time head of a nationally prominent firm of attorneys in Boston, member of the governing bodies of both Harvard University and Massachusetts Institute of Technology, and chairman of the newly organized State Board of Education. Mr. Fish explained that the State Legislature of Massachusetts had recently made certain sweeping changes in the machinery of public education in that Commonwealth. From the days of Horace Mann there had been a State Board of Education, the chief function of which was to supervise the activities of the State Normal Schools, and to assist the smaller communities in providing the services of superintendents. The board employed a secretary who functioned as the equivalent of state superintendent in advising the legislature.

Massachusetts was one of the chief industrial states in the union, but for a number of years had been experiencing increasing shortages of skilled labor. A decline in the agricultural production of the state had also been evident for some time. To study these unfavorable conditions, and to formulate recommendations for improvement or amelioration, the legislature, under the leadership of Governor William L. Douglas, created a State Commission on Industrial Education. The report of this Commission, known as the Douglas Commission, appeared in 1906, and recommended the creation of a State Board of Industrial Education, with power and appropriations to establish systems of trade, industrial, and agricultural schools for youths beyond the age of compulsory school attendance, 14 years.

The State Board was created, but it was soon discovered that "the problems of establishing the kinds of schools proposed were immensely complicated. . . . None of the educational agencies already in existence seemed to satisfy the needs of Massachusetts industries for skilled artisans or of the state for farmers." At that period, nowhere in the United States had any comprehensive system of public school training of workers as yet been developed. Further, the report of the Commission made it clear that the historic systems of apprenticeship no longer met the needs of modern industry, while the sons of farmers seldom remained on the farms to learn under their fathers.

The newly created State Board for Industrial Education, independently of the regular public school system, inaugurated some schools and classes in the effort to cope with these conditions and problems, but without notable success. Much adverse criticism was encountered, not only from conservative school superintendents, high school principals, and citizens generally, but even from the State Normal Schools, and from the State Board of Education, all of whom protested that their prerogatives were being disregarded. These criticisms became so intense and so concerted that the legislature decided to abolish the Board for Industrial Education, and the existing State Board of Education, as well, and then to create an entirely new State Board of Education, with greatly enlarged powers. The new law provided that the members of the board should be appointed by the governor.

It was provided, further, that the new board, of nine members, should appoint a chief executive officer to be known as the State Commissioner of Education. Under him were to be two deputy commissioners, one for industrial education, and one for general education. In the interview with Mr. Fish it was explained that the new board had determined to try to find a qualified commissioner from outside the state, and that Dean Russell had strongly recommended Dr. Snedden for the post.

By this date, Dr. Snedden had reached the conclusion that his greatest contribution would be in the field of educational administration, and for a number of years he had become more and more convinced by his studies in educational sociology and educational objectives, and by his growing interest in the problems of vocational education, that therein lay one of the greatest social challenges of the future. As he listened to the portrayal by Mr. Fish, "it now seemed that the Massachusetts position was as good an administrative post as existed in the United States." Accordingly, although not unmindful of the attractions of his work at Teachers College, he told Mr. Fish that he would accept if he were offered the appointment.

At about the middle of November, 1909, Dr. Snedden received notice of his appointment, and arrangements were made for him to take up his new duties on January 15, 1910. He remained in this position six and one-half years, his resignation becoming effective on July 1, 1916.

Soon after taking office Commissioner Snedden nominated the following persons for appointment as members of his staff: Charles A. Prosser, at that time a graduate student at Teachers

[2]From a letter to Dr. Randall J. Condon, written in December, 1904. See, "Early Conceptions of Industrial Arts," INDUSTRIAL ARTS AND VOCATIONAL EDUCATION magazine, May, 1952, p. 155.

College, as deputy commissioner of vocational education; William Orr, principal of the high school at Springfield, Mass., as deputy commissioner of general education; Charles R. Allen, director of the industrial school at New Bedford, as state agent for industrial education; and Rufus W. Stimson, supervisor of agricultural education at Northampton, as state agent for agricultural education.

Accomplishments in Massachusetts

In retrospect, more than 30 years later, Dr. Snedden enumerated the following as the chief accomplishments of his six years as State Commissioner of Education in Massachusetts:

1. The creation by the state legislature, with the support of the State Board of Education, of the first fairly complete state pension plan for teachers. The outstanding feature of this plan was its so-called "contributory" provision, which was at that time relatively novel in pension plans. "Since that time, many of the states have developed pension systems."

2. The statutes dealing with public education, which were enacted by the legislature over so many years as to have reached a state of considerable confusion and even of conflict, were codified. The major part of the detailed work of codification was done by Charles A. Prosser.

3. Some genuine advances were achieved in agricultural and homemaking education.

4. "But not much was accomplished to foster the kinds of industrial education in which I most believed and advocated, either in Massachusetts or elsewhere, either then or since. The reasons for that lie deep in the changing economic conditions of our country, and are too complex to be explained here."

While these statements are quoted in Dr. Snedden's own words, from his *Recollections*, published in 1949, it is scarcely necessary to add that other competent judges do not share these views. I decided to include this quotation as one more expression of Dr. Snedden's striving for the ideal. and perhaps the unattainable, and of his disposition to be caustically critical at times, even of his own proposals and achievements.

5. In 1914, there was established a state-wide system of university extension lectures and courses under its own organization.

Guiding Principles

In partial explanation of Dr. Snedden's disappointment at the accomplishments in the area of vocational education of his six years as Commissioner of Education in Massachusetts, it is instructive to note the statement of his beliefs and convictions regarding vocational education, as recorded in his *Recollections*, more than 33 years after leaving Massachusetts, and more than 13 years after his retirement from active teaching at Teachers College.

1. Every normal individual should and does exercise a vocation; that is, a pursuit by which he secures a livelihood for those dependent upon him or her.

2. Under conditions of precivilization the great majority of youth learned their vocations from parents or as apprentices to workers already competent.

3. But, under the conditions of modern economic production, very few parents teach their own vocations to their children.

4. Under these same conditions, organized apprenticeship tends to disappear.

5. Because of these and other conditions, millions of unskilled workers drift excessively from simple jobs to other temporary jobs. The majority drift and fail — last to be employed, first to be discharged. From these come most vagrants and criminals.

6. Every youth or young adult can and should be taught some one or a few of the thousands of vocations through which the enormous production of America is now carried on.

7. The universal teaching of vocations would serve better than any other social force to reduce criminality and vagrancy, increase the efficiency of all industry, and other productive processes.

8. In the following suggestions Dr. Snedden considered that he made "his most original contributions of plans and policies, which as yet most educators oppose, and most laymen cannot see through":

a) Under present-day conditions, training for all but a few vocations cannot be included in ordinary high schools or for youths under 18 years of age.

b) Only in separate, specialized schools, to be entered only after 18 years of age, can genuine and effective vocational education be given — as is now given in the cases of such aristocratic vocational schools as medicine, engineering, and other professional callings.

(To be continued)

'Twas the Night Before Christmas

GLENN C. HESS
Industrial Arts Teacher
Junior High School, Baldwinsville Academy, and Central School
Baldwinsville, N. Y.

Each year the faculty, custodians, and the office girls in our school pin Christmas cards on the main bulletin board as a greeting to students and friends. Many are originals, block prints, spatter paintings, and silk-screen work. This eliminates the need for each person sending greetings to many others. The teacher's association provides a border of evergreens, and a row of thumbtacks. The industrial-arts department provides a banner across the top with the words, "A Merry Christmas to All!"

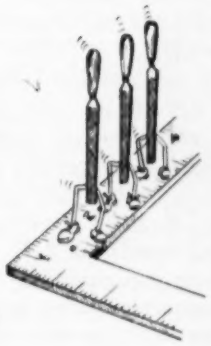
Every year, too, the industrial-arts teachers break forth with a "poem." The accompanying " 'Twas the Night Before Christmas" was used for the 1952 Christmas season.

'Twas the night before Christmas
in the Industrial-Arts Shop
All was quiet except
For the big round Clock

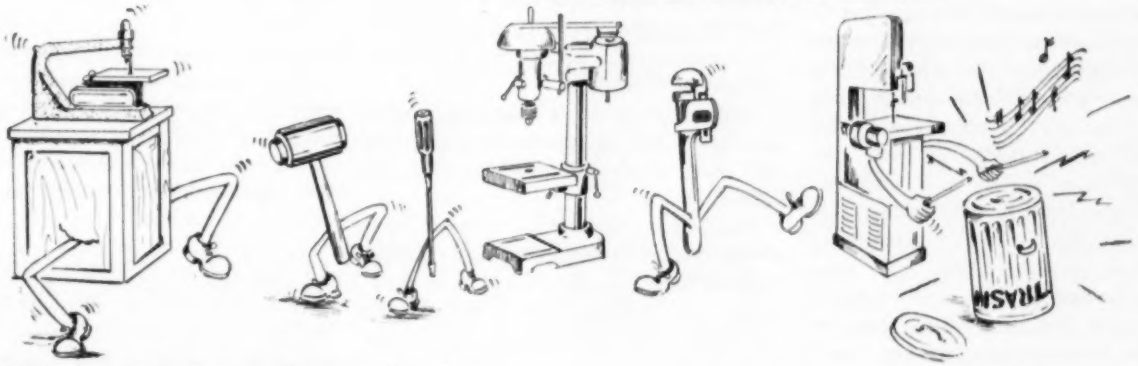
The tools were in their places, all dusted with care
For the boys who would use them wouldn't be there.

THEN up spoke the Spokeshave
His voice was so gay

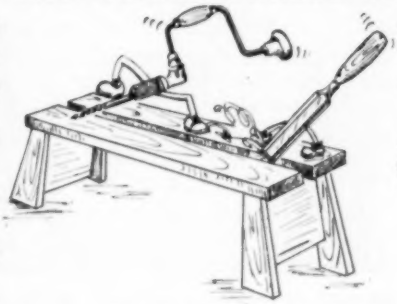
"I'M on the Level, it's Plane
We'll be here Christmas Day



"LET'S get up a dance, and march on the Square
We'll Drill with the Drill Press,
In File and with Care."



THEN the Jig Saw danced a jig
And the Band Saw beat the band
The music they made was simply grand
The Mallet danced so hard, it got red in the face!



The Chisel put a Bit in the Sawhorse
And rode with the Brace . . .

And the song that was sung by every gay tool
Was

Merry Christmas

To Everyone in the Whole School!

Christmas poster submitted by Glenn C. Hess, industrial-arts teacher, Baldwinsville, N. Y.

INDUSTRIAL ARTS and VOCATIONAL EDUCATION

JOHN J. METZ, Editor

THE DECEMBER, 1953, ISSUE

Volume 42 of INDUSTRIAL ARTS AND VOCATIONAL EDUCATION has been completed when the present issue reaches you.

During the year just past, this magazine has added 358 pages more to the lore of our profession, besides many additional pages of news notes of different kinds.

This material was furnished by more than 225 of our own profession who were willing to go to the trouble of gathering and arranging the material in order to assist their fellow workers. Many of these contributors are the ranking men in our field. Many of them are from institutions in which our new teachers are prepared, and a large number are teachers who may rightly be termed master teachers. It must not be forgotten, however, that many of those who contributed are men who teach in elementary schools and junior high schools, who have written down what they have found useful in their own classes, thinking rightly that what has helped them also may help others.

Geographically, these contributors come from states, cities, and communities located in every part of America, and now that some of our teachers serve in various capacities in many lands, we may truthfully say our magazine brings you material garnered from international sources.

In this, the last issue of 1953, the editor wants to say a most heartfelt *thank you* to those who have helped him serve that fine group of men — the shop teachers of America.

CHICAGO, THE CONVENTION CITY, INVITES YOU

When this issue of INDUSTRIAL ARTS AND VOCATIONAL EDUCATION arrives at your desk, you will still have time to make arrangements to attend the 1953 American Vocational Association convention at Chicago.

The convention will be held earlier this year than it has been in the past; hence, the preconvention news this year was published in the November issue of INDUSTRIAL ARTS AND VOCATIONAL EDUCATION.

Last year the convention was held in the old historical city of Boston. It was well attended and much worth-while business was transacted. This year it will meet in the city of Chicago, November 23 to 27, a large industrial city that is more centrally located, and therefore, will be more easily reached by many more members.

Make no mistake, there will be a large attendance and you will miss something worth while if you are not there.

All of the various divisions will hold worth-while meetings. The different vocational groups as well as the industrial-arts divisions have set up exceptionally fine programs. Join the rest of the AVA members and get the full benefit of your own membership.

The *Ship*, a social organization of members of reliable dealers and manufacturers of equipment and hand and power tools used in the educational field, promises a most interesting program to the members who attend the AVA convention at Chicago.

There will be an outstanding exhibit of educational equipment and supplies, and many prizes will be donated by the exhibitors.

Harry Sears, chairman of the citation committee, will present the *Ship's* annual citation for outstanding services to vocational and industrial-arts education, to the man who has been chosen for the year 1953.

WHY BE A SHOP TEACHER?

Just recently the writer, in conversation with one of his co-workers at The Bruce Publishing Company, got another heart-warming glimpse of what it really means to be a teacher of industrial arts and vocational education. The man to whom he was speaking, a topnotch mechanic himself, is about at the retirement age and is looking forward to the many things he will be able to do during his leisure time when he retires.

The discussion of just this phase of our conversation brought out the information that this man's son of twenty-seven has a home workshop in which he loves to work. The shop is equipped with every conceivable kind of hand and power tool, the greater part of which was bought and paid for by the son.

His father told me that "my son learned to work with tools and machines at the Washington High School in Milwaukee, and he still raves about the teacher who taught him Shopwork." The boy served two and one-half years in the navy, but just as soon as he returned from his war service, he started in with his home shop again, and his interest has not abated either, now that he is about to be married. He is now working as an installer of industrial kitchens.

The point that this editorial is trying to make, however, is that the industrial-arts course which he took while at school has broadened his life to such an extent that now he is willing to spend money for equipment which he can use to do work more easily, more speedily, and more accurately, to make his life and the lives of his family more enjoyable.

He is sold on tools and on his home shop because an interested shop teacher steered him in that direction.

That boy has learned to spend his leisure by using his hands and his head.

No doubt he loves baseball (especially when the Braves are winning) and basketball, football, and the like, but he also knows how to make his own life and the lives of his family interesting by his own efforts.

Besides that, his industrial-arts experience has given him skills which made it possible for him to enter his present job and advance in it. His teacher can be proud of what he accomplished with this student. No doubt he will not be quite as fortunate with every one of his students, but a certain percentage of them will profit in a similar manner.

Isn't that enough reason to be a shop teacher? And the writer is sure that most shop instructors would be most happy to be the teacher that he is writing about if they could have seen that father's face when he described what his son had learned from his high school shop teacher.

THE 1953 INDEX

If you wish to secure an index for Volume 42, write to our circulation department and a copy of the index will be sent to you as soon as it is off the press.

PROBLEMS AND PROJECTS

CREATIVE LEATHERCRAFT

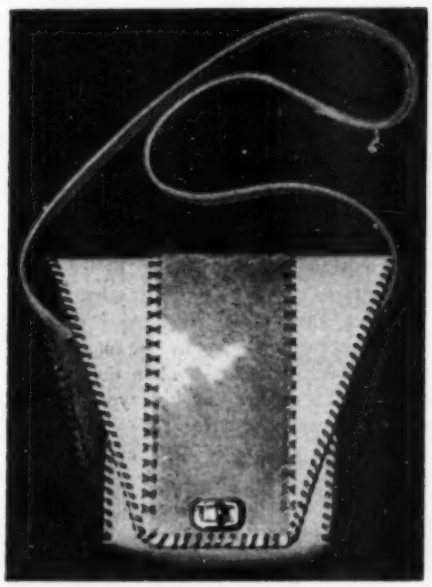
CLARK HEIPLE
Craft Instructor
Senior High School
Prescott, Ariz.

Here in the West there is a considerable interest in elaborately carved leatherwork. Because the amount of learning and creative thinking involved in doing carved leatherwork is limited, we use the attraction of the material to stimulate analytical thinking to approach contemporary leatherwork. The problem involving a purse is analyzed as follows:

1. *Function*
   - *a*) To hold and carry things
   - *b*) Over-all size
   - *c*) Size and position of pockets
   - *d*) Accessible opening
   - *e*) Leathers for hard use and flexibility
2. *Beauty*
   - *a*) Size in proportion to owner's figure
   - *b*) Color of leather to complement costumes
   - *c*) Play of textures — unborn calf, alligator grains, etc.
   - *d*) Laced or stitched to enhance form

When the student has carefully thought through the needs for his own purse, the next problem is designing the purse to utilize these factors. By folding newspapers the students cut freehand patterns that they think will meet their requirements. Gussets of contemporary shape and form are chosen to go with the rest of the purse and to have it look balanced and to possess adequate capacity. Purse snaps are another challenge. Commercial base forms can be covered with plastic, copper, or enameled ware. Thongs, covered button medallions, all can be used as fastenings that are purposeful and decorative. We experiment on scrap leather to find the lacing type that fits our design.

In the illustration, the purse was made for a tall slender woman whose most frequent choice of clothing is casual and sporty. We used one leather upon another, with decorative lacing enhancing the basic shape. The textural quality of the haircalf in contrast with the smoothness of the yellow cowhide is especially interesting. Suede lines this purse, adding strength, but maintaining softness. Creative leathercraft is fun. The joy and pride in owning and carrying something individually designed for a special person provides a powerful stimuli, and working out the problem from beginning to end is a great satisfaction.



Leather purse
—Photo by C. Bender

HOW DO YOU TEACH DRAWER MAKING?

H. A. ALLENDER
Instructor of Woodworking
Will Rogers High School
Tulsa, Okla.

The teaching of drawer making presents a major problem in the writer's shop because of the following conditions.

1. A drawer is often essential to the design of a finished project.
2. Very few high school boys are capable of proceeding with drawer making without close supervision, which at best is very difficult for the instructor to give.
3. A drawer that is not well made is an abomination.
4. Group instruction is almost impossible to give because only a few students are making drawers at any one given time.
5. A student is not going to learn to make drawers by making one drawer only, any more than a student is going to learn to work long division problems by working just one problem. Frequently, however, one and only one drawer is needed.

Because of the foregoing conditions, the writer has used the three following procedures in order to accomplish the job of teaching drawer making in his own shop.

1. When a student arrives at the place where a drawer must be made, the instructor simply makes the drawer in as short a time as possible with the student looking on, and then hands it to the student in an almost finished condition.

Although this method does not furnish much opportunity for training the student, it is not entirely without its advantages. One advantage is it requires a minimum amount of the instructor's time and energy. Another advantage is it assures the finished project of a well-made drawer. It also eliminates waste of materials, and waiting for machines on the part of other students. Obviously, however, this method is not to be recommended as educationally sound, even if the busy instructor does have to resort to it at times.

2. Another approach sometimes used by the writer is as follows. Outline to the student the procedure required and then rely upon the student to find his own way through the various stages in making a drawer. He will at best have to apply the trial and error technique.

This method has in it some advantages as well as some disadvantages. It requires but little of the instructor's time, and assuming that experience is a good teacher, the student will learn much at firsthand about drawer construction by the time he gets through the required operations. On the other hand, it should be said that a waste of materials will be often experienced. Considerable waste of

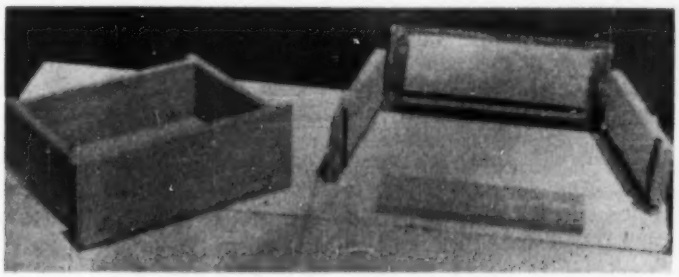
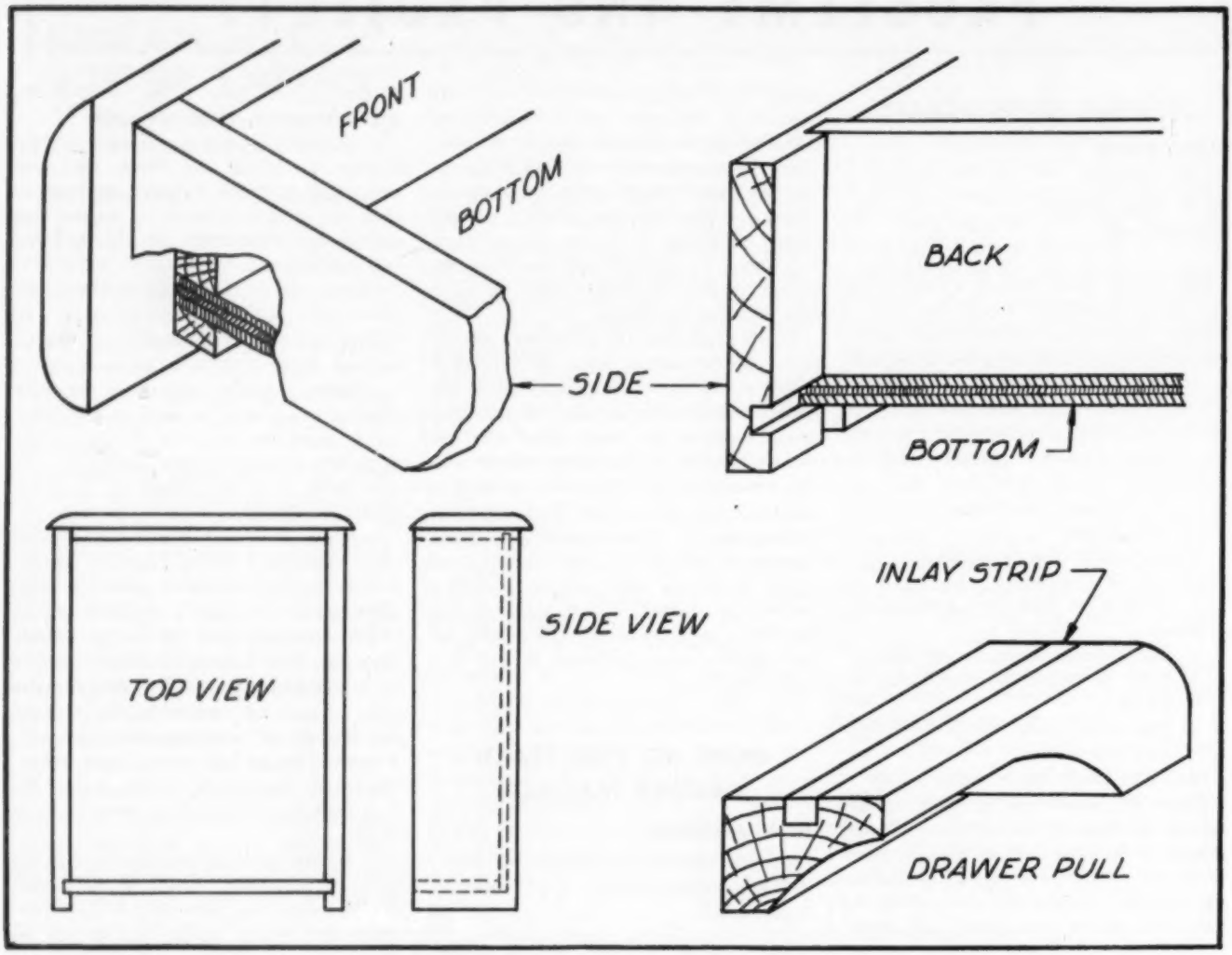


Fig. 1. The sample drawers



Details of the parts of the sample drawer

student time waiting for machines will also result, and a poorly made drawer will result more often than not.

3. From the standpoint of increasing the knowledge and skill of the student the following method is hereby recommended as an improvement over the two that have just been described. When a student reaches the place where he must start the drawer or drawers for his project, introduce him to the problem by having him study the types of drawers from books and other sources so as to determine the most appropriate type of drawer for his project. The overhanging lip type is by far the most popular in the writer's shop. When this decision has been reached, have him to get out the stock for the four main pieces of each drawer, namely, the front, sides, and back. These should be squared to finished size. When this is done the various operations of making the lips, joints, and grooves must begin.

These can best be explained to the student by having two sample (small) drawers on a display board. One of them assembled, the other one unassembled. See Figure 1. The lips, joints, and grooves are all made in both drawers. Through the use of this device the writer has found that the problem of teaching the various operations of drawer construction is greatly reduced.

From this point on, have the student make the ledges for the lips on edges of front, and the rabbet joints on inside of ends of front for lips plus thickness of sides. Then have him saw the groove in the front near the lower edge for the drawer bottom. Next have him saw the grooves in the sides near the lower edges for the bottom. The next job is to have him saw the dado in the sides for the back of the drawer. The next job is to complete the lip on the front by rounding the ends and edges with a plane. The student may then assemble the drawer using nails and glue for fastening the joints. The bottom is then made and inserted into the grooves in the sides and underneath of the back, and pushed up to and into the groove in the lower edge of the front as shown.

The foregoing is a discussion of the methods that may be employed for instructional purposes only and does not present any mechanical features of the drawer making itself. Following along with the working drawing and the photographs will show the construction that is most frequently used in the writer's classes. The overhanging lip type on the front is recommended for three reasons. It furnishes an automatic stop at the right point. It gives a simple but pleasing type of decoration. It will provide for a greater tolerance in fitting the drawer without showing undesirable cracks around the drawer.

The ratio existing between the thickness of the materials used for the drawer parts is as follows. The front is made of ¾-in. lumber,

the sides ½ in., the back ⅜ in., and the bottom ¼ in.

As is shown by the drawing the bottom is put into place after the main parts are assembled and as indicated above. The bottom is fastened by nailing it with brads from the bottom side into the bottom edge of the back. This method of installing the bottom is recommended for the following reasons. It simplifies the construction of the main frame. The dimensions of the bottom can be more easily and accurately determined after the main frame has been assembled. The bottom can be removed and replaced if necessary without dismantling the whole drawer.

Drawer pulls may be obtained of the following materials: glass, plastics, metal, and wood. They may be shop made or purchased. A very popular type of drawer pull in the writer's shop is made as follows. Saw any desirable hardwood scrap stock to ¾ by ⅞ in. Make one saw kerf about ⅛ in. wide, and ⅜ in. deep lengthwise in one side of the stock. Inlay strip of some wood that contrasts in color. Walnut and maple, or mahogany and white pine work very well. Lay off the stock in 5-in. lengths. Each 5-in. length will make one drawer pull. Make finger grips as shown on shaper. The finger grips should be made before sawing into 5-in. lengths because of the hazard of working short pieces on the shaper. The outside corners and edges may be decorated to suit the taste. This is a good way to use up small scrap stock. The pulls may be attached with screws or glued.

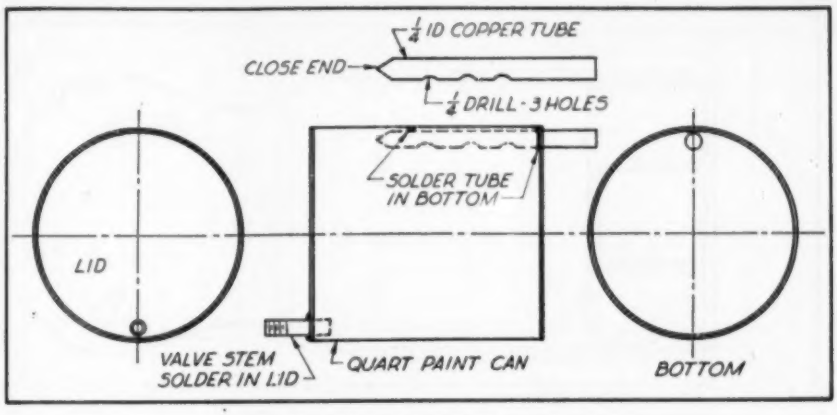
The photographs as well as the drawing show the construction of the drawer including the pulls.

The reader will note that simplicity is here emphasized. More intricate joints would no doubt increase the value, but it would at the same time increase the difficulty of instruction. This more often than otherwise ends in poor results. The writer takes the position that a simple process well done is much to be desired over a more complicated process not well done.

FLOCK GUN

SCOTT WILLIAMSON
Zundelowitz Junior High School
Wichita Falls, Tex.

The flock gun illustrated and described herewith can be used with hand pump or compressor. It was designed for a shop where we had air pressure but were unable to buy a pressure gun to cover large surfaces. Although it is inexpensive the results have proved to be as good as can be had with a pressure gun. All that is needed is a one-quart paint can, one valve stem, and one copper tube 4 or 5 in. long, plus a small amount of solder. When using, hold tube on top and have valve stem at bottom as shown.



Drawing of the flock gun

I have used both bicycle and auto tire valve stems on the flock gun since they are the same size on the end where the air chuck is attached. However, when I use an auto tube stem I saw it off so it will not extend too far out from the lid and is thus more rigid.

The reason for using stems is to make the gun adaptable for tire pump as well as air line chuck use. Those who do not have a compressor and those who want to make a gun portable may attach the tire pump hose by screwing on the chuck. The tire pump gives a good pressure and is very satisfactory.

Those who have air lines may flock in short bursts or for longer periods by holding the air chuck in place and removing it when an area has been covered.

A COBBLER'S BENCH COFFEE TABLE

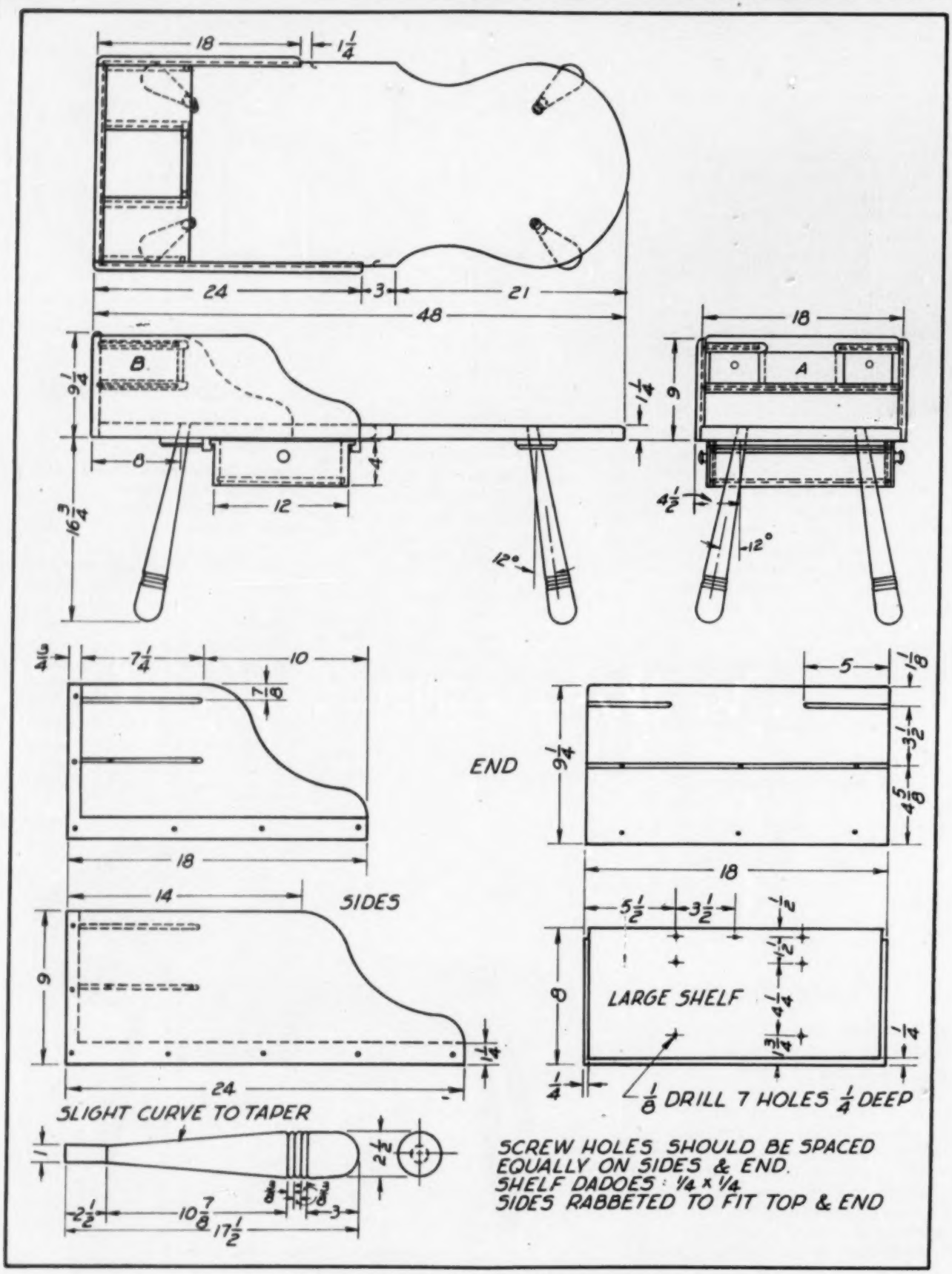
HARVEY C. HART
Student, Department of Industrial Arts
University of California
Santa Barbara, College
Santa Barbara, Calif.

The cobbler's bench, after serving its usefulness in the shoe repair shop, remains with us as a piece of home furniture.

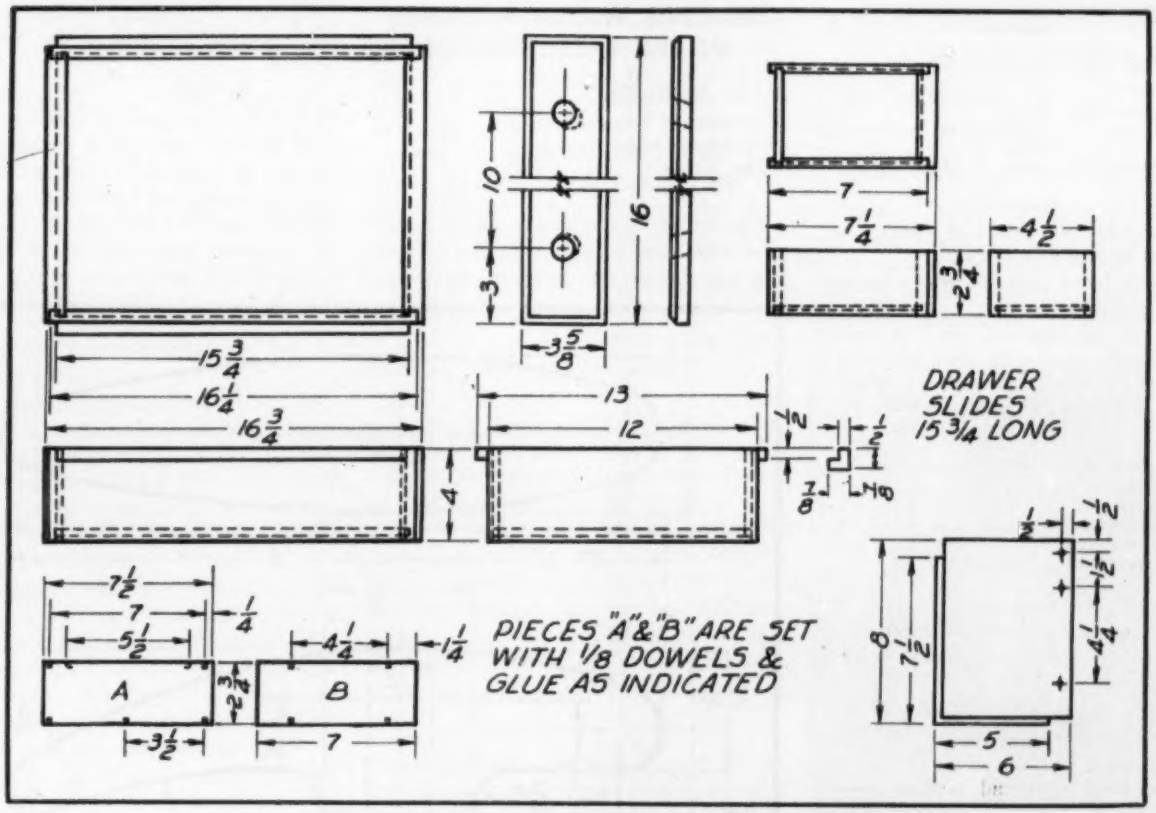
This project, as compared with many other projects, taxes skill and workmanship to a high degree. Within its construction one has an opportunity to use all the machines found in a well-equipped woodshop. Completed carefully and finished in taste, it links the past with the present for continued usefulness.*

*Introductory note by Dr. Wm. F. Holtrop, Department of Industrial Arts, Santa Barbara College, Santa Barbara, Calif.

A cobbler's bench coffee table



Detailed drawing of parts of the cobbler's bench coffee table



Details of drawer for a cobbler's bench coffee table

ROUGH BILL OF MATERIALS

Material	*Size*
No. 1 Eastern Hardrock Maple	8 lin. ft. 1½" x 10"
No. 1 Eastern Hardrock Maple	12 lin. ft. 1" x 10"
No. 1 Eastern Hardrock Maple	2½ lin. ft. 2½" x 6"
Maple plywood	⅛" x 24" x 18"
Maple plywood	⅛" x 7" x 8"

Hardware

No. of Pieces	*Part Name*	*Size*
2	Brass drawer pulls	½"
2	Birch drawer pulls	1¼"
3 doz.	Flathead Bright woodscrews	No. 10 x 1½"
8	Flathead Bright woodscrews	No. 6 x 1½"
8	Flathead Bright woodscrews	No. 6 x ¾"

Preliminary Plan of Procedure

1. Purchase material as per bill of material.
2. Lay out and cut blanks for legs.
3. Surface and joint material for top portion.
4. Lay out and cut material for sides and back of top portion.
5. Lay out and cut material for shelves and supports.
6. Fit and glue up top portion of bench.
7. Cut, joint, and glue material for bench top.
8. Surface and shape bench top.
9. Glue bench top and upper portion together.
10. Turn legs and glue into bench.
11. Lay out, cut and glue small drawers.
12. Lay out, cut and glue large drawers.
13. Sand and finish.

PROCEDURE FOR TURNING LEGS

Parts List

No. of Pieces	*Part Name*	*Material*	*Size*
4	Legs	Maple	2½" x 2½" x 18"

Procedure

1. Cut pieces to size as per parts list and notch for mounting in the lathe.
2. Mount in lathe and turn as indicated on detail drawing.
3. Sand to smooth finish.

PROCEDURE FOR UPPER PORTION OF TABLE

Parts List

No. of Pieces	*Part Name*	*Material*	*Size*
1	Shelf	Maple	¾" x 8" x 18"
2	Shelves	Maple	¾" x 8" x 6"
4	Shelf supports	Maple	½" x 2¾" x 7"
1	Planter front	Maple	½" x 2¾" x 7½"
2	Facing strips	Maple	½" x ½" x 2¾"
1	End	Maple	¾" x 9¼" x 18"
1	Short side	Maple	¾" x 9" x 18"
1	Long side	Maple	¾" x 9" x 24"

Procedure

1. Cut pieces for complete top portion.
2. Dado and rabbet as shown in detail drawing.
3. Cut tongues, grooves, and drill holes for screws and dowels as shown.
4. Preassemble and check all joints for fit.
5. Glue all joints and fasten with blind screws.
6. Scrape off glue and sand to smooth finish.

PROCEDURE FOR TABLE TOP

Parts List

No. of Pieces	*Part Name*	*Material*	*Size*
2	Table top	Maple	1½" x 10" x 48"
2	Cleats	Maple	¾" x ¾" x 14½"

Procedure

1. Joint working faces and edges of both 1½-in. pieces.
2. Surface other side of both 1½-in. pieces.
3. Check grain, prepare and glue joint to make 1 piece, 18 by 48 in.
4. Joint one side and surface to 1¼-in. thickness.
5. Prepare cleats as shown.
6. Shape bench top and bullnose edges as shown.
7. Mount cleats with glue and screws as shown.
8. Drill holes for legs.
9. Sand to smooth finish.

PROCEDURE FOR LARGE DRAWER
Parts List

No. of Pieces	*Part Name*	*Material*	*Size*
2	Drawer fronts	Maple	¾" x 4" x 12"
2	Drawer sides	Maple	½" x 4" x 16¼"
1	Bottom	Maple Plywood	1⅛" x 11" x 15¾"
2	Drawer pulls	Birch	1¼"

Procedure

1. Cut pieces for drawer as shown.
2. Cut, fit and glue all joints.
3. Install drawer pulls and remove for sanding and finishing.
4. Scrape off glue and sand to smooth finish.

PROCEDURE FOR SMALL DRAWER
Parts List

No. of Pieces	*Part Name*	*Material*	*Size*
2	Drawer fronts	Maple	¾" x 2¾" x 4½"
4	Drawer sides	Maple	½" x 2¾" x 7¼"
2	Drawer backs	Maple	½" x 2¾" x 4"
2	Drawer bottoms	Maple	⅛" x 4" x 6⅝"
2	Drawer pulls	Brass	½"

Procedure

1. Cut pieces for 2 complete drawers.
2. Dado and rabbet as shown on detail drawing.
3. Check, fit, and glue together.
4. Install hardware; remove for sanding and finishing.
5. Scrape off glue and sand to smooth finish.

PROCEDURE FOR DRAWER SLIDES
Parts List

No. of Pieces	*Part Name*	*Material*	*Size*
2	Slides for attachment on drawer	Maple	½" x ½" x 16"
2	Slides for attachment to bench	Maple	1" x 1" x 16"

Procedure

1. Cut pieces as indicated.
2. Dado, drill, and counterbore as shown.
3. Sand sliding surfaces — No. 4/0 garnet cabinet paper.
4. Mount with glue and screws on bottom side of bench and sides of large drawer as shown.
5. Scrape off glue and sand smooth.

Finishing Procedure

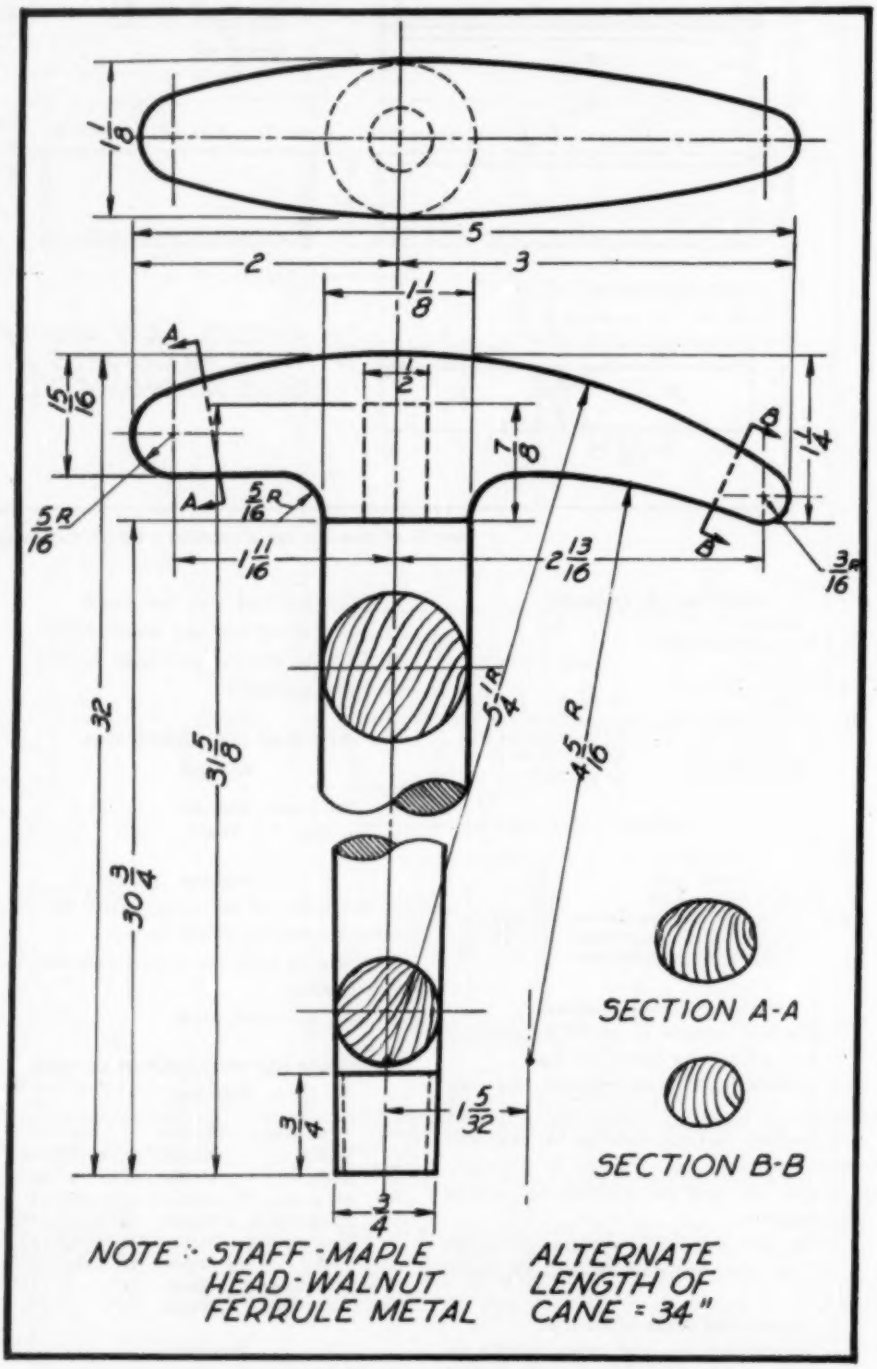
1. Plug all screw holes with wooden plugs.
2. Finish sanding with No. 6/0 garnet cabinet paper taking care not to sand across the grain.
3. Apply maple stain and allow 24 hours to dry.
4. Apply one coat of sanding sealer, allowing one hour to dry.
5. Rub smooth with No. 4/0 steel wool.
6. Apply six successive coats of lacquer.
7. Rub down with lacquer rubbing compound and felt pad.
8. Apply hard polishing wax.
9. Polish with soft cloth.

MAKING WALKING CANES IN THE HIGH SCHOOL

H. A. ALLENDER
Instructor of Woodworking
Will Rogers High School
Tulsa, Okla.

The writer of this article gets a request each school year to make a quantity of walking canes from the American Red Cross. These canes are used by convalescing patients who are under the care of the Red Cross hospitals.

Up to the time of the first request from the Red Cross, the problem of making walking canes had not come up in his shop. When the job was attempted it was found to be very challenging and interesting. After considerable study and experimenting the following procedure was found to be the most successful. It is hereby given in outline form.



Detailed drawing of parts of the walking cane

1. Get out stock for staff to 1/16 of an in., over thickness and width, and ½ in. over length. As can be seen from the drawing the finish dimensions of the staff are 1⅛ in. in diameter at the large end, ¾ in. in diameter at the smaller end, and 32 in. in length. The stock can be squared up to the dimensions indicated on the power saw and jointer. Hard maple makes a good cane.

2. The square staff is then tapered on the table saw employing the use of shop-made jigs. After the tapering the staff was 1 3/16 by 1 3/16 in. at the large end and ⅞ by ⅞ in. at the smaller end.

3. The next step is to reduce the staff from a four-sided piece to an eight-sided piece. This can be accomplished by setting the fence on the jointer to a 45-deg. angle, and setting the in feed table to get the proper depth cut so as to remove the correct amount from each corner in one pass.

4. The next process is to lay out and drill the center of both ends of the staff to receive the live and dead centers of the lathe for turning later. Two shallow saw kerfs at right angles to each other should be made in the end of the staff for the live center. This is the larger end and therefore the top.

5. The next operation is to mount the staff in the lathe, and with a block plane remove the remaining eight corners, making the staff as nearly round as possible. This is done with the lathe not running.

6. The metal ferrule is now fitted to the bottom end (lathe running). Use a drive fit.

7. Then sand the staff to the finished size, using No. 2 floor sanding paper. After getting staff to proper size use fine grade of sandpaper to remove scratches left by the No. 2 sandpaper.

8. The next operation is to turn the ½-in. extension on the top end of the staff, to which the walnut head is later attached.

9. Get out stock for head, 1⅛ by 1⅛ by 5 in.

10. Drill hole in head as shown on drawing. Use the drill press.

11. Rough out the head as shown, using band saw, disk, and belt sanders.

12. Glue head onto staff.

13. Finish head and staff by hand, using the wood rasp and sandpaper.

14. For the final finish use white shellac and clear varnish, two coats of each.

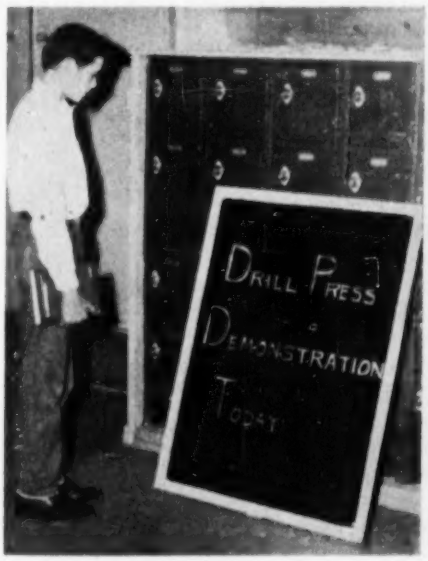
The foregoing procedure is written as though only one cane is to be made. Actually the request each year is for a dozen canes. For this reason each operation was performed on all 12 parts before going on to the next operation on any of them. This greatly aided production and also assured uniformity.

Colonel Ethan Allen, who gained fame as commander of Vermont's fighting "Green Mountain Boys" during the Revolutionary War, was the builder and owner of a blast furnace at what is now Lakeville, Connecticut, in 1762. — *Steel Facts.*

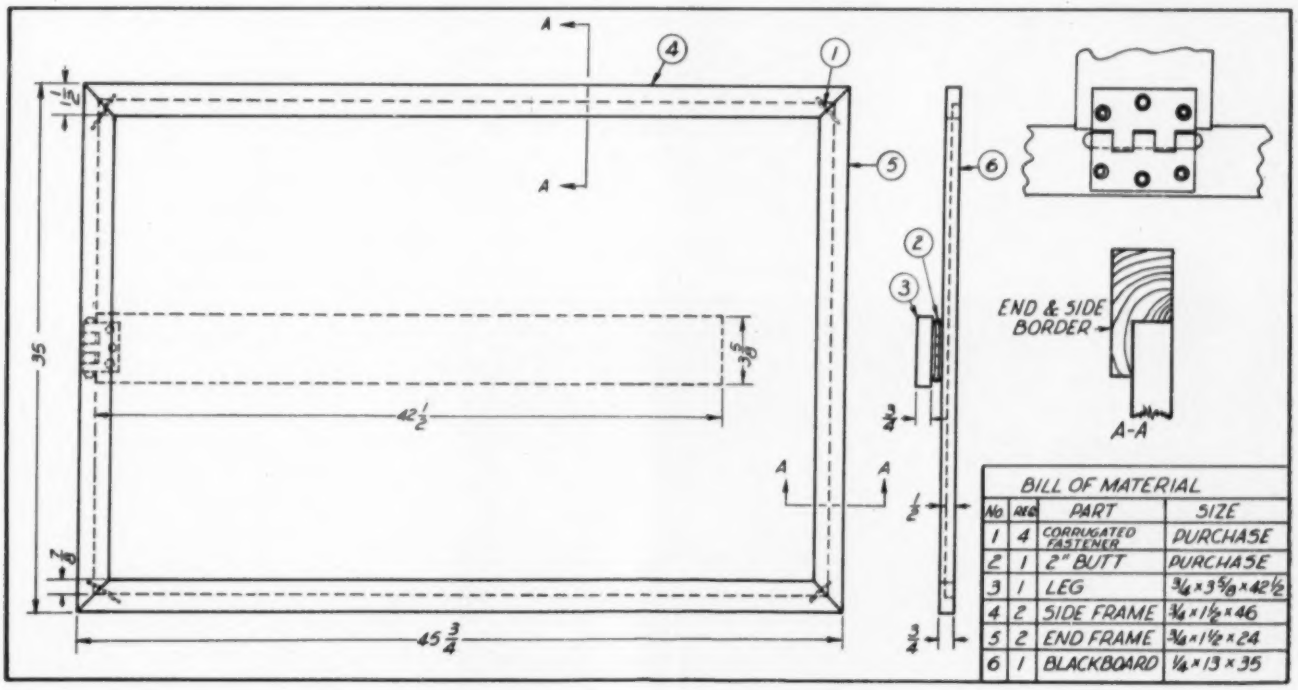
A TIME AND VOICE SAVING BULLETIN BOARD

G. W. SCHNEIDER
Metal Shop Instructor
High School
El Monte, Calif.

This is a teaching aid which has been used with much success at our school. There are many announcements and instructions which must be given to students in order to have a smooth operating shop. This announcement



The voice saver in use


A
4
1
5
6
2
3
A
END & SIDE BORDER
A-A
35
42 1/2
45 3/4
BILL OF MATERIAL
NO | REQ | PART | SIZE
1 | 4 | CORRUGATED FASTENER | PURCHASE
2 | 1 | 2" BUTT | PURCHASE
3 | 1 | LEG | 3/4 x 3 5/8 x 42 1/2
4 | 2 | SIDE FRAME | 3/4 x 1 1/2 x 46
5 | 2 | END FRAME | 3/4 x 1 1/2 x 24
6 | 1 | BLACKBOARD | 1/4 x 13 x 35

Detailed drawing of the bulletin board

board is placed near the entrance door to the shop and is used to make pertinent announcements, such as: assembly today; short periods; athletic schedule; demonstration; examination; short day; extended day; report cards today.

An instructor who is handling five classes or 150 students daily must repeat instructions to each student. The bulletin board saves time, avoids confusion, and eases the work load. The use of this teaching aid keeps the instructor from feeling like a *recording* at the end of the school day.

A DICTATION RECORD PLAYER

EARL H. KIMBALL
West High School
Waterloo, Iowa

The dictation record player shown in Figure 1 is a device for use in giving dictation to stenography classes. Dictation may be given to the whole class through the loudspeaker, or to a group of one to six persons by means of headphones while the rest of the class carries on with routine drills. Adults find this feature particularly helpful in evening school classes where their purpose is to *brush up* on their shorthand, preparatory to taking stenographic positions.

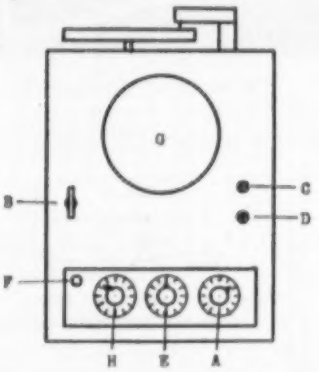


Fig. 2

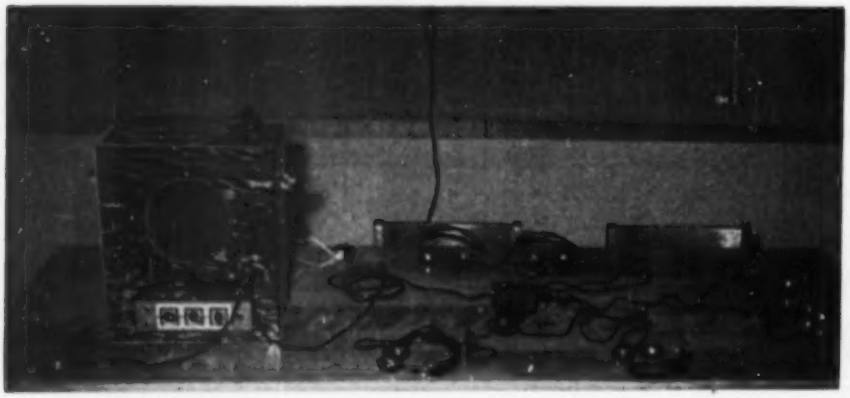


Fig. 1

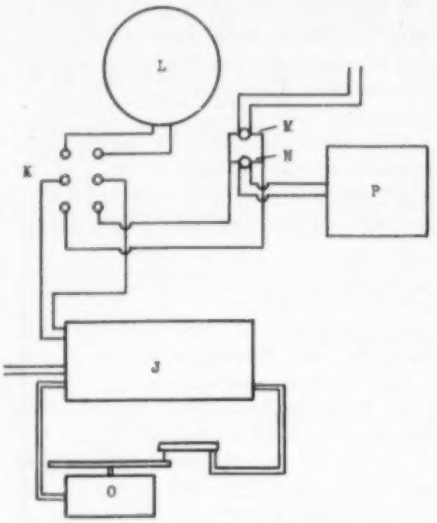


Fig. 3

Recordings are available so that the dictation can be given at 60, 80, 100, or 120 words per minute, with the record player operating at the standard speed of 78⅓ r.p.m. To provide variety, recordings may be made by carefully planning and timing the dictation material.

Figure 2 is a diagram showing the principal features of the device. When plugged in on 110 volts, the current is switched on and off at *A*. This switch controls the power input. *B* is a double-throw switch which cuts in the speaker, *G*, in the *up* position, and the headphones in the *down* position. The instructor plugs in his headphones at *C* as he adjusts the volume for the student headphones at *A*. Six headphones for students may be plugged into the phone box which contains two receptacles on each of three sides, wired in parallel. The phone box is plugged in at *D*.

Dictation may be given over a microphone from an adjoining room by plugging in the microphone at *F*. *H* controls the amplification of the microphone and *E* controls the speaker.

Figure 3 shows the wiring diagram. The apparatus required consists of an 8 watt amplifier, *J*; a loud-speaker, *L*; a record player with an electrical pickup, *O*; a phone box, *F*; and seven 2000 ohm headphones. The output transformer is tapped 500, 250, 16, 8, and 4 ohms. The taps used depend on the type of headphones and loudspeaker. The 8 ohm tap was used on the one shown in Figure 1.

The amplifier, *J*, is connected to the midpoints on the double throw switch, *K*, as shown. The speaker, *L*, is wired to one side of the switch, and the two jacks, *M* and *N*, for the headphones are wired to the other side. The record player, indicated at *O*, is controlled by the switch on the amplifier. The electrical pickup is connected to the amplifier to provide the input for amplification.

The case shown in Figure 1 was made of ¼-in. plywood and has two handles for convenience in carrying. When in use, it may be placed on one end of a long table with the phone box at the other end, where six pupils may be seated to take dictation.

MASONITE BEDFRAME WITH END TABLES

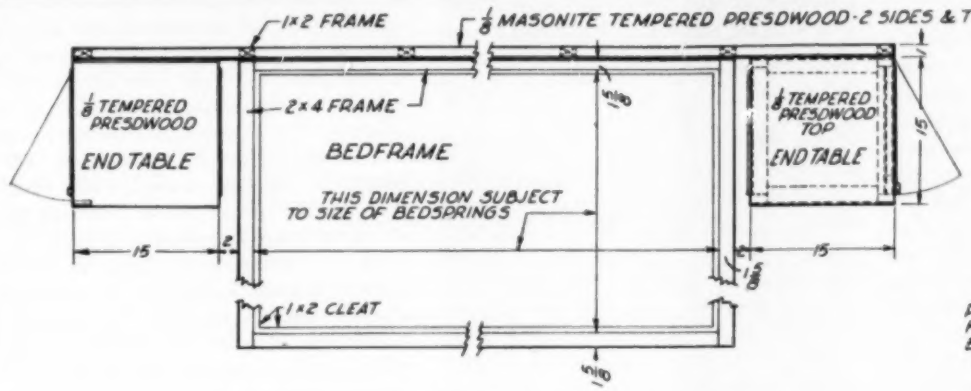
MASONITE CORPORATION
Chicago, Ill.

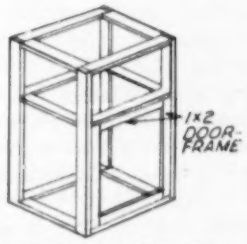
This unit consists of four parts, namely: one headboard panel, one bedspring frame, two end tables.

Headboard panel: The headboard panel is composed of a framework of 1 by 2-in. members covered on all sides with ⅛-in. Masonite Tempered Presdwood. Use casein glue and finishing nails for securing tempered Presdwood to frame. Corners to be butt jointed. The length of the panel is subject to the size of the bedspring frame, which in turn is subject to the size of the chosen bedspring. For final assembly the headboard panel is secured to the bedspring frame with wood screws. Masonite panels may be sealed with an oil sealer or waxed, or primed and painted any desired color.

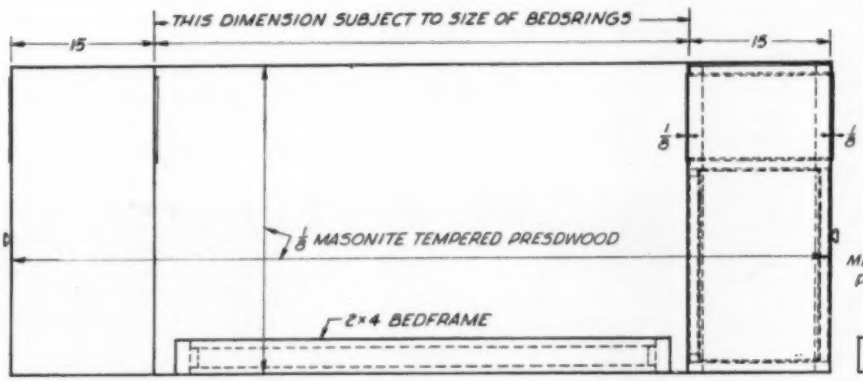
Bedspring frame: The bedspring frame is subject to the size of the selected bedspring. This may be a twin bed size, three quarter size, or a full double bed size. The frame is composed of four 2 by 4-in. set on edge and nailed together. On the inside of the frame a 1 by 2-in. cleat is nailed on, upon which sets the bedspring. This frame should be primed and painted any desired color.

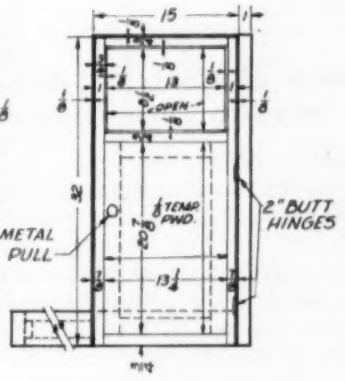
End tables: The two end tables are free standing and may be placed in any position desired. They can be secured to the headboard panel with wood screws, if desired. This is recommended because it will give more support to the headboard panel. The framework of the end tables is composed of



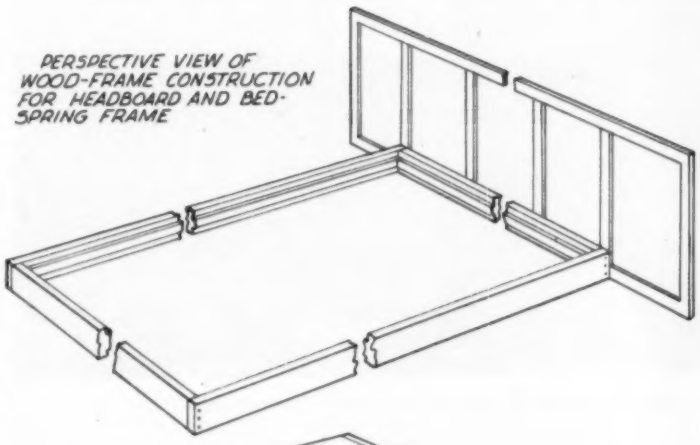


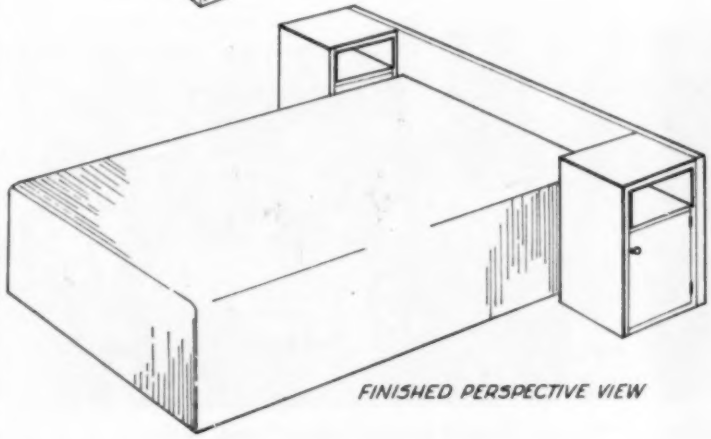
PERSPECTIVE VIEW OF WOOD-FRAME CONSTRUCTION FOR END TABLES





PERSPECTIVE VIEW OF WOOD-FRAME CONSTRUCTION FOR HEADBOARD AND BED-SPRING FRAME





FINISHED PERSPECTIVE VIEW

APPROXIMATE BILL OF MATERIALS

No. of Pieces	Size	Material	Description
		HEADBOARD	
2	¾" x 1⅜" x 32"	White Pine	Vertical end pieces
4	¾" x 1⅜" x 29¾"	White Pine	Vertical intermediate supports
2	¾" x 1⅜" x X (X denotes dimension subject to size of bed springs)	White Pine	Horizontal top and bottom rails
2	⅛" x 1" x 31⅞"	⅛" Masonite Tempered Presdwood	Side pieces
1	⅛" x 1" x X	⅛" Masonite Tempered Presdwood	Top piece
2	⅛" x 31⅞" x X	⅛" Masonite Tempered Presdwood	Front and back piece
		BEDSPRING FRAME	
2	1⅜" x 3⅜" x X	White Pine	Side rails
2	1⅜" x 3⅜" x X	White Pine	Head and front rails
2	¾" x 1⅜" x X	White Pine	Cleats
2	¾" x 1⅜" x X	White Pine	Cleats
		ONE END TABLE	
4	¾" x 1⅜" x 31⅞"	White Pine	A
6	¾" x 1⅜" x 13¼"	White Pine	B
6	¾" x 1⅜" x 12½"	White Pine	C
2	¾" x 1⅜" x 20⅞"	White Pine	Vertical Door Frames
2	¾" x 1⅜" x 13¼"	White Pine	Horizontal Door Frame
1	Metal Knob		
1	Bullet Catch		
1	⅛" x 15" x 15"	⅛" Masonite Tempered Presdwood	Top
2	⅛" x 15" x 31⅞"	⅛" Masonite Tempered Presdwood	Sides
1	⅛" x 13¼" x 20⅞"	⅛" Masonite Tempered Presdwood	Back
2	⅛" x 13¼" x 20⅞"	⅛" Masonite Tempered Presdwood	Door front and back
2	⅛" x 13¼" x 14¼"	⅛" Masonite Tempered Presdwood	Top and bottom lining for open shelf
2	⅛" x 9⅝" x 15¼"	⅛" Masonite Tempered Presdwood	Side lining for open shelf
2	⅛" x 13⅞" x 20⅞"	⅛" Masonite Tempered Presdwood	Side lining for compartment
2	⅛" x 13¼" x 13⅞"	⅛" Masonite Tempered Presdwood	Top and bottom lining for compartment

Masonite bedframe with end tables

1 by 2-in. members securely held together with nails and corrugated fasteners. The doorframe is also composed of 1 by 2-in. members. The exterior of the table, inside of open shelf, inside of compartment, and the two sides of the door should be covered with ⅛-in. Masonite tempered Presdwood, secured to the wood framework with casein glue and finishing nails. Note that the tempered Presdwood forming the lining of the shelf projects ⅛-in. beyond the exposed wood frame. Hang the door using two 2 by 2-in. steel butt hinges and fasten with a bullet catch let into the side rail near the metal door pull. The exposed wood surfaces may be finished natural with shellac or may be painted same as the tempered Presdwood panels.

NEW CENTRAL NORMAL SCHOOL, LIMA, PERU

STUART A. ANDERSON
Technical Director of Vocational Education
Lima, Peru

The second semester of the school year is well under way in Lima, Peru. The illustration shows the students and faculty in the technical division of the new Central Normal School. This teachers' college prepares men teachers for elementary, secondary, and industrial vocational schools.

The group in the illustration includes 62 students, 10 faculty members, and 2 vocational specialists — J. Arthur Elmer and myself.

This institution has made a good start in the field of industrial teacher education. Last year 44 young men completed a two-year course. They are now teaching in the various industrial institutes of this country. The present group will take a three-year program. In the future we hope to offer a four-year curriculum.

OVERHEAD PROJECTOR FOR TEACHING DRAFTING

M. E. Warner
Drafting Instructor
McKinley High School
Cedar Rapids, Iowa

Industrial-arts instructors — especially drafting teachers — have long realized the value of visual aids. The use of models, "mock ups," pictures, chalkboards, bulletin boards, posters, demonstrations, and more recently motion pictures and slide projections have been, and are, an integral part of the industrial-arts instructor's teaching technique.

Most drafting instructors who teach sizable groups admit frequently feeling dissatisfied with their class demonstrations because of inability to show accurately the steps and processes involved in making a drawing so that everyone can see clearly. If the instructor could take a few pupils at a time to a drawing board and go through the procedure of making the drawing step by step with the same instruments the pupils use the learning situation would probably be nearly perfect. However, such procedure, for most instructors would present the additional problem of what to do with the remainder of the class; and the time element would almost eliminate this method where it is necessary to present material to groups of normal size. Blackboard demonstrations have not proved entirely effective because of the equipment involved. The instructor who has endeavored to hold the T square and triangles in place while he draws knows the difficulties involved. True, there are special instruments for the chalkboard but these are not the instruments the pupil will use at his board. Chalk does not lend itself to making accurate drawings. More problems are involved in making the drawing to a size that will be visible to the class and preserve the true proportions

Fig. 1. Using the projector in the drafting room

Students and faculty in the technical division of the new Central Normal School, Lima, Peru

of the drawing. The instructor must effectively explain the procedure as he draws. He cannot very well draw and explain at the same time or he finds himself talking to the chalkboard. He, by necessity, blocks the view of part of the class a large part of the time. These interruptions result in loss of continuity for the pupil and a lag in interest and attention.

The overhead projector[1] is not a cure for all of the faults and shortcomings of the drafting demonstration; however, the writer has found that it has certain definite advantages: (1) The instructor can demonstrate while facing the class at all times: See Figure 1. (2) He can draw, write, or letter on the projection surface and have every stroke of the pencil projected to the screen back of him as he makes it. (3) Much time can be saved for both the pupil and the instructor. (4) It can be operated with the room fully lighted, unlike the opaque projector, slide projector, or moving picture projector. (5) Except for the pencil the instructor can use the same type of instruments the pupil uses.

Figure 2 shows diagrammatically the principle of the overhead projector. Light is projected through the glass projection surface by means of a reflector, lens, and mirror arrangement to a second lens and mirror which projects the image to the screen back of the operator. The instructor makes the drawing in the normal position and the pupil sees it on the screen in the same position. The vertical adjustment knob at the top of the machine moves the mirror shifting the projected image higher or lower on the screen. The focusing knob raises and lowers the projection head to bring the image into sharp focus on the screen. The distance from the projector to the screen is determined by the image size desired. A projector with a 7 by 7-in. projection surface placed 8 ft. from the screen gives an image approximately 4 ft. square. The screen is usually placed slightly above the projector so the operator will not block the view of the class; this causes "keystoning" of the image, i.e., the image is wider at the top than at the bottom. Slanting the top of the screen toward the projector as shown in Figure 2 will eliminate the distortion. The amount of slant can be determined experimentally.

Although intended for projection of transparent materials the overhead projector can be used to project the shape of opaque objects by placing the objects on the projection surface. Figure 3 shows four examples of such use: A. The pencil with the wood cut away exposing the lead. B. The pencil lead sanded to a conical point. C. The adjustment of the needle point and lead of the bow compass. D. The bow dividers.

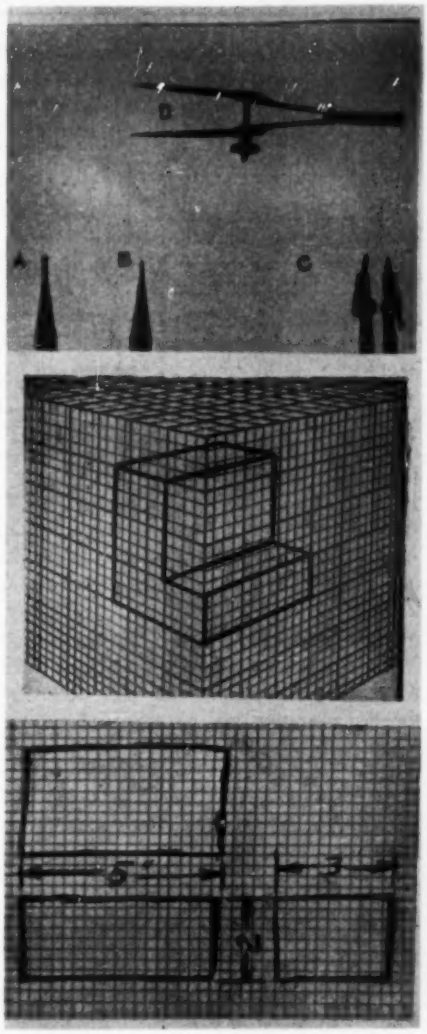


Fig. 3 (at top) – Projecting the shape of opaque objects

Fig. 4 (center)

Fig. 5 (at bottom)

The writer introduces beginning drafting pupils to the drafting language by having them make pictorial sketches from orthographic projections. The pupils make perspective sketches by placing tracing paper over the perspective of a cube,[2] which has its surface ruled with perspective lines one fourth inch apart, and drawing the edges of the sketch along the lines on the cube faces. Figure 4 shows a skeleton used in demonstrating the process of making such sketches. The skeleton was made by drawing lines on transparent plastic with the ruling pen, using black India ink specially made for use on acetate.[3] Most India ink does not adhere well to plastic, tending to "crawl" leaving open spaces in the lines. Plastic ink,[4] black and in colors, is available but because of the rapid evaporation of the solvent it is very difficult to use with the ruling pen and the results have not been satisfactory. The India ink lines on the skeleton can be protected by placing another sheet of plastic over the inked surface and cementing the two sheets at the corners. Sketches are made by using pencils made for marking on glazed surfaces.[5] These pencils come in a variety of colors but the marks or lines made are opaque and project black. There is an advantage to the instructor, in some cases, in using different colors for different parts of the drawing. Lines can be removed with the regular pencil eraser or they can be wiped off with a coarse cloth. Figure 5 shows the projection of a demonstration plastic sheet ruled to simulate cross section paper, which can be used for demonstrating the sketching of orthographic views preliminary to making a finished drawing.

The process of making an orthographic projection with instruments can be demonstrated by attaching a plastic sheet to a mask made by cutting a hole in a piece of heavy paper to represent the size of the drawing paper used by the pupils. If 9 by 12-in. drawing paper is used, the mask can be made half size (4½ by 6 in.), this will fit the standard size projection surface. The drawing can be made half size on the plastic sheet. When making the drawing for the class, it

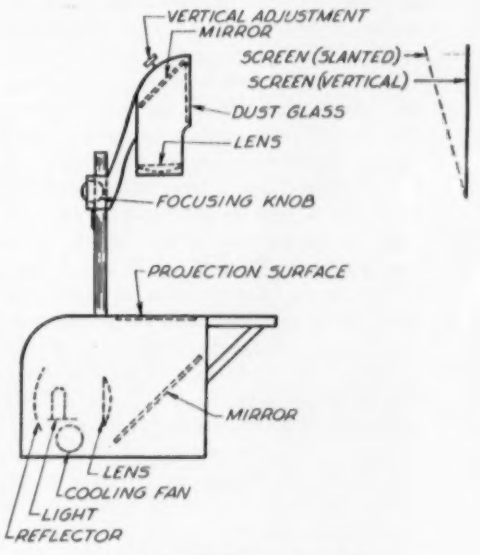


Fig. 2. Diagrammatic view of the projector

[1]The projector referred to in this article is the "Vu Graph," Mfg. by Charles Beseler Co., Newark 8, N. J. Other overhead projectors are similar in principle and operation.

[2]Walsh's Perspective Skeleton — Frank W. Walsh, Oshkosh, Wis.

[3]Mfg. by M. Grumbacher, Inc., New York, N. Y.

[4]Craftint, Craftint Mfg. Co., Cleveland, Ohio.

[5]Dixon Phano for glazed surfaces, or any china marking pencil.

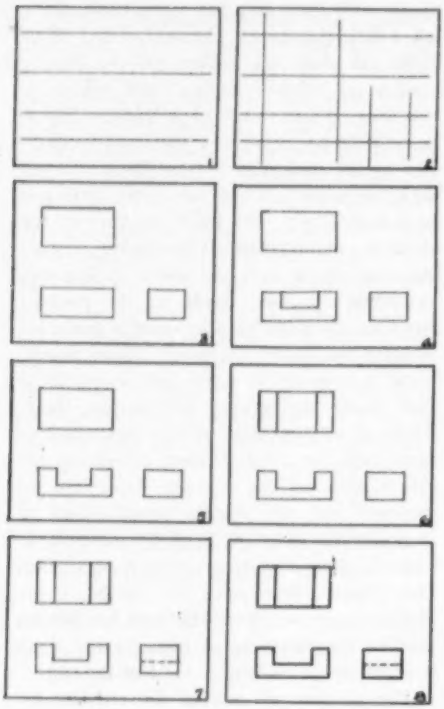


Fig. 6

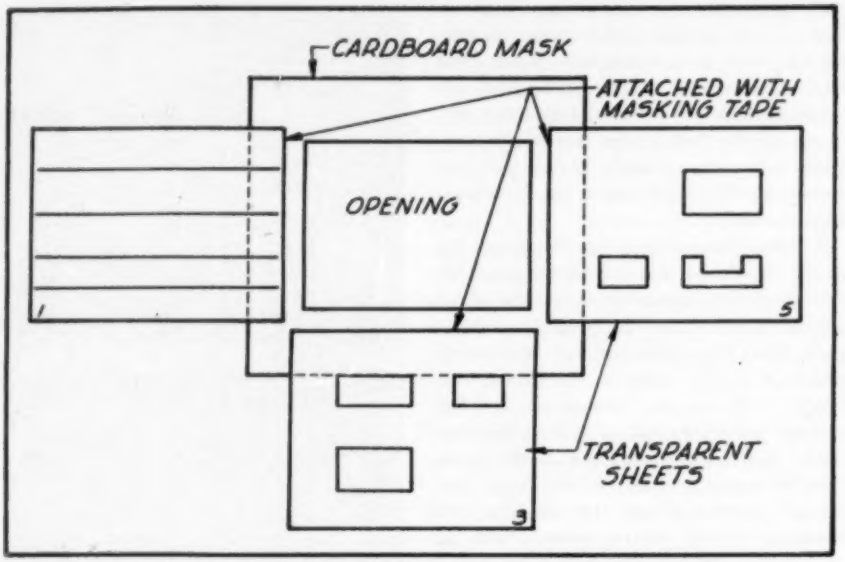


Fig. 8. Use of the projector in teaching drafting

is not necessary to mention the fact that the measurements are half size, unless it is desirable to do so, since the graduations on the wood scale will not be projected. A small T square and small triangles can be used by placing the head of the T square against the side of the projector. If circles are required, the compass lead can be replaced with the lead from a marking pencil.

As the pupils progress the instructor will find that it is unnecessary to make complete drawings in demonstrations. The parts the instructor is confident the pupil understands and can do, can be prepared before class and the parts on which instruction is necessary can be completed in the demonstration. For example, when a class is ready to make patterns of truncated cones, the pupils will have developed several cone patterns and will know how to draw the pattern of the complete cone. Therefore, the pattern of the basic cone can be drawn on the sheet before class; class time can then be spent in finding the true lengths and completing the pattern concentrating the instructional efforts on the new operations to be learned. If several classes of the same level are being taught, time can be saved by making the preliminary part of the drawing one of the following ways: (1) Make the drawing on the back of the plastic sheet with the pencil. A little care in handling the sheet will prevent the lines from being rubbed off. (2) Cover the pencil drawing with a second plastic sheet on which the completion of the problem will be drawn. (3) Draw the preliminary part with ink. After the demonstration, the part drawn in the demonstration can be wiped off with a rough cloth and the preliminary part retained for the next class.

A roll attachment consisting of a roll of transparent plastic film which can be drawn over the projection surface by means of a take-up roller, makes it possible to prepare a number of illustrative sketches, then project them when desired. The film is suitable for sketching or arithmetic computations but not adapted to use with the instruments because it is not held firmly enough in place. The standard model projector has the roll of film at the side so the T square cannot be used when the film is over the projection surface. The master projector has the rolls at the top and bottom. The perspective skeleton or orthographic sketching skeleton can be placed on the projector and held in place by the clamps provided for that purpose and the film can be rolled over the skeleton and sketches made on the film. The film can be torn off as used or rolled up and reprojected later as a review.

Transparent rules, protractors, and some scales are available commercially. However,

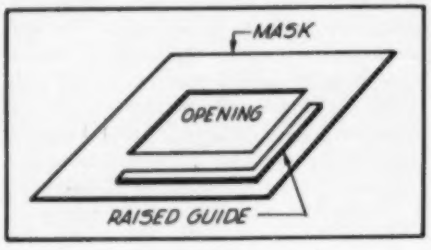


Fig. 7

most scales, other than full size are too small to be seen well when projected. Demonstration scales can be made which are larger than actual size by inking the lines on plastic or if the use of an ozalid printer is available ozachrome[6] prints can be made. Such scales can be longer than the projection surface of the machine since it is not necessary that the entire scale be projected at one time. Measuring and scaling instruction with the aid of such scales is very effective since the pupil can easily read the divisions on the screen and make comparisons with the scale in his hands.

The steps and sequences in making different types of drawings can be quickly and effectively demonstrated by the use of transparent overlays. An overlay consists of several transparent sheets each having part of the drawing on it. Lines can be added to the projection of the drawing by laying another sheet containing the necessary lines over the drawing already shown; likewise lines can be removed by taking off one of the sheets. A set of overlays can be made by drawing each part to be added or removed on a separate sheet of plastic. Another method is to print the sheets on ozachrome. Tracings are made and printed with an ozalid printer. If an ozalid machine is not available the tracings can be sent to a commercial reproduction plant for printing; or they can be printed by hand by exposing the film to sunlight, or with a printing box equipped with ultraviolet lights. Such printers are available commercially[7] or can be constructed eco-

[6]Ozalid Division, General Aniline and Film Corp., Johnson City, N. J.

[7]Booklet: Vu-graphics — Charles Beseler Co., 60 Badger Ave., Newark 8, N. J., $1.

nomically. The prints can be developed in a large glass jar with a tight lid by placing a few drops of strong ammonia on a blotter at the bottom of the jar then placing the film in the ammonia fumes.[8] Ozachrome prints can be made in color as well as black and white. The prints last indefinitely if protected from bright natural light; they fade rapidly in sunlight, but artificial light has little effect.

The first step in making a set of overlays is to decide how much of the drawing to add or remove with each sheet. Figure 6 shows the stages illustrated by a set of overlays for use with a beginning drafting class of ninth-grade level in teaching the steps in making an orthographic projection. Frame 1 shows sheet 1 with the major vertical measurements laid off and the blocking in lines drawn. Frame 2 shows sheet 2 added with the horizontal measurements made and the vertical blocking in lines drawn. Frame 3 shows the views with the overhanging lines removed. This is accomplished by removing sheets 1 and 2 and laying down sheet 3 containing the views. Frame 4 shows sheet 4 added with the detail shape of the front view blocked in. Frame 5 shows sheets 3 and 4 removed and sheet 5 in place with the unusued part of the upper line of the front view removed. Frame 6 shows sheet 6 added showing the visible edges projected in the top view. Frame 7 shows sheet 7 added with the hidden edge projected in the right side view. Frame 8 shows sheet 8 added with the lines drawn to object line value. Other sheets can be added to show the steps in dimensioning if desired. The transparent sheets may be laid on the projector using care to place each subsequent sheet in the exact position desired. A cardboard mask can be made with a raised guide of thin wood or plastic strips attached against which the edges of the sheets can be placed bringing the lines automatically to the proper position. See Figure 7. The sheets can be attached to the mask with masking tape, or by other means, so they can be turned down into position like the pages of a book, Figure 8. Making overlays involves a large amount of work and consumes a great amount of time. Transparent overlays are available commercially in some other educational fields.

A film[9] is available for use with the projector, which looks very much like carbon paper, with which the ordinary pencil can be used to draw, letter, or write. The pencil cuts through the opaque surface leaving lines through which light shows as white lines on a black background when projected. Information can be typed on the film by removing or locking the typewriter ribbon. The film has not been found advantageous for making drawings as it is very delicate to handle; moving the instruments over it scratches the surface making lines and light spots appear on the projection. Lines once drawn cannot be removed.

Two attachments are available for the overhead projector: (1) The slide adapter, in two sizes 3¼ by 4 in. and 2 by 2 in. (2) The tachistoscope. The slide adapter makes it possible to project slides the same screen size as the image of the projector's working surface. Because of the short distance to the screen the overhead projector with the adapter can be used without darkening the room.

The tachistoscope is an attachment for timing the projection. It can be set to one of several intervals and at the end of which it shuts off. This attachment can be used whenever it is desired to develop or measure speed in recognition. The drafting instructor can use it for teaching recognition of symbols and conventions and for developing speed in reading drawings.

It must be borne in mind that any errors in the prepared transparent copy or in drawings made during the demonstration will be greatly magnified on the screen, therefore utmost care and accuracy of workmanship is always essential. The success of the demonstration via the overhead projector, not unlike that of most teaching techniques, lies mainly in the wise selection of illustrative problems and the orderly, careful, and skilled execution of the techniques and procedures involved.

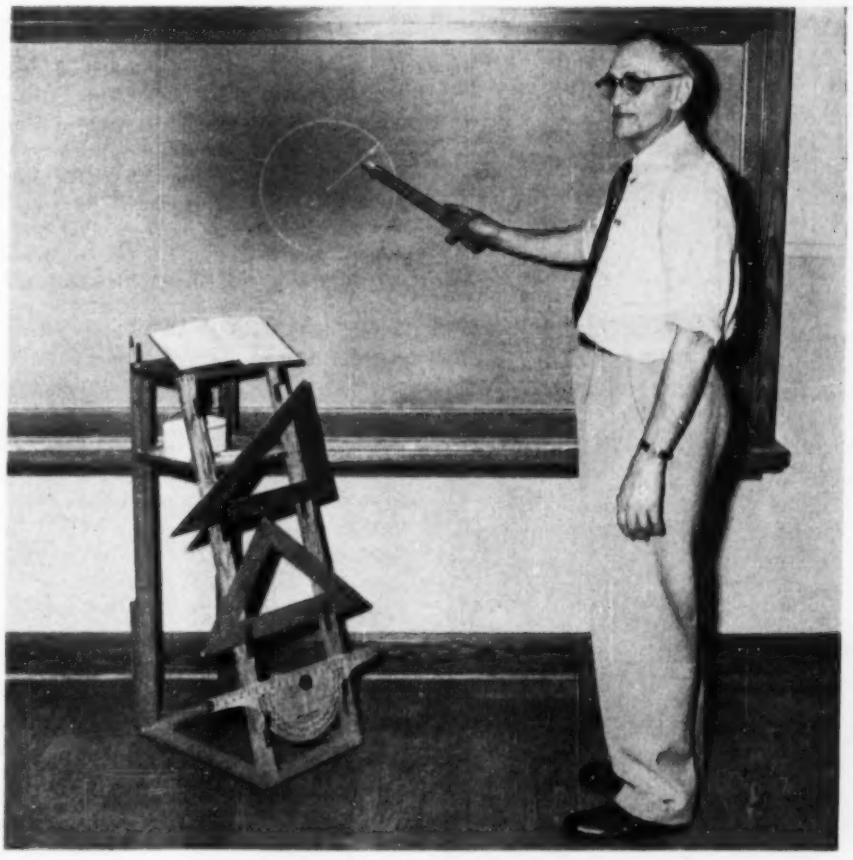
[8]Teacher training film: The Overhead Projector, 16mm., sound, black and white, 16 minutes running time. Extension Division State University of Iowa, Bureau of Audio-Visual Instruction, Iowa City, Iowa.

[9]Vu-Graph Film, Charles Beseler Co., Newark 8, N. J.

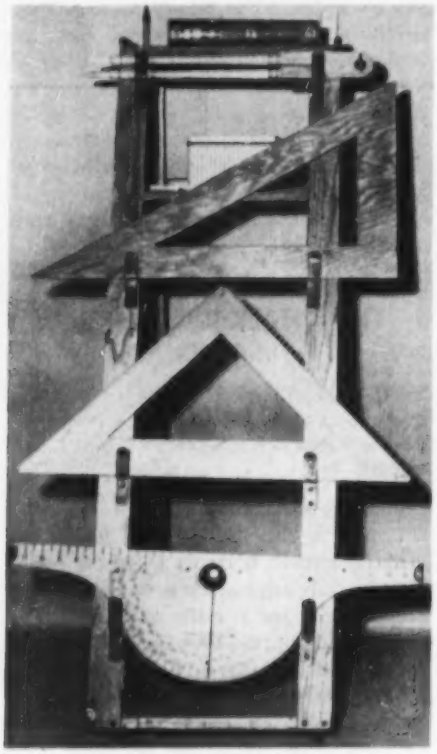
THE CHALKBOARD STEP SAVER

HARLAN J. SHUFELT
Consultant in Industrial Arts
Racine Public Schools
Racine, Wis.

The purpose of this chalkboard step saver is to save the time and energy of the teacher in the classroom. It carries all of the equipment used by the teacher in any chalkboard demonstration and is easily constructed. The top is 8 by 14 in., and the base is 14 by 22 in., and the height is 42 in. Ball rollers enable it to roll easily over the floor in any direction. It rolls if the teacher leads it by placing his hand on the top surface and guides it to

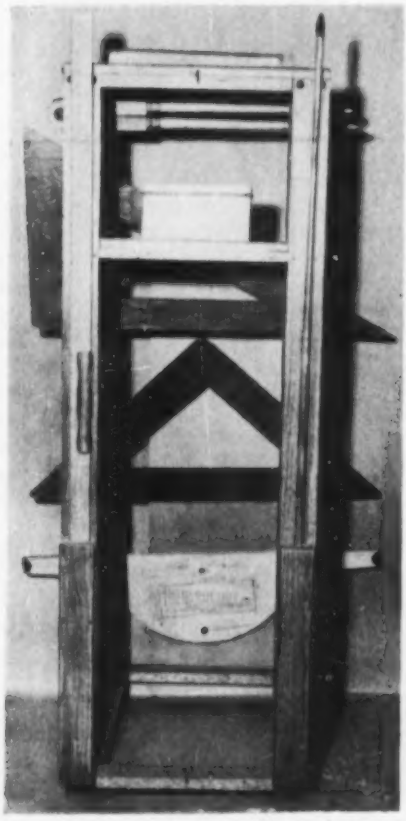


The chalkboard step saver in use



Front view of chalkboard

— Photographs, courtesy of Racine Public Schools



Rear view of chalkboard

where he is giving the demonstration. It contains chalk, compasses, textbook, 45-, and 30 by 60-degree triangles, gravity protractors, chalkboard pointer, and model of the object being demonstrated. It saves the teacher many steps and has proved itself an aid in very effective teaching. Any classroom will profit from its use.

It was constructed by William Schubert, industrial-arts instructor, at the Henry Mitchell Junior High School, Racine, Wis.

IDENTIFICATION-CARD TEST

MARION C. ALLEN
Junior High School
Logan, Ohio

For a number of years an industrial-arts identification-card test has been used with much success by the writer in the Logan Junior High School.

The construction of this type of test involves more work than the objective test that is now in general use. However, once the test (cards) have been prepared they can be used over and over again. In preparing the test cards, pictures and drawings were cut from catalogues, textbooks, workbooks, and magazines of the various tools, materials, and processes in the various areas of industrial arts offered at the school. The pictures and drawings thus obtained were fastened to three by five index cards by means of rubber cement. On each of these cards multiple-choice answers were typed. Usually four possible answers were placed on each card, but only one is the correct answer. See Figure 1.

All areas of industrial arts can be covered with this type of identification-card test. For each area of study fifty or more cards can be prepared.

The cards can be used, not only as an area test, but as a visual aid during lecture periods, or they may be used for review study. By combining cards from the various areas, a comprehensive final examination can be prepared.

To use the cards either as an area test or as a final examination, one would first pick out the cards that are to be used and then assign each a number. The number is placed in one corner, usually the upper left-hand corner. The cards are arranged in numerical order. The pupil prepares a sheet of paper with columns of numbers corresponding to the number of cards to be used in the test. The preparation of the test sheet should be done previous to the time of the testing. The preparation of the test sheet should follow a definite plan. Each pupil prepares the test sheet as directed by the teacher. All test sheets should be exactly alike, because of the greater ease thus provided for taking and scoring the test. Test sheets can be mimeographed. If the test sheet has been properly prepared and numbered, a key to the test can now be made to fit the test to be given.

With cards and test sheet prepared, pupils are then ready to take the test. The first pupil looks at the number 1 card. If the third answer of the four possible answers is the correct answer, the pupil (if he knows the correct answer) places the number 3 beside the number 1 of his test sheet. The pupil passes the number 1 card to the next pupil. He in turn places his answer to the number 1 question or card on his test sheet, and passes the card along to the next pupil. The cards are passed along from pupil to pupil

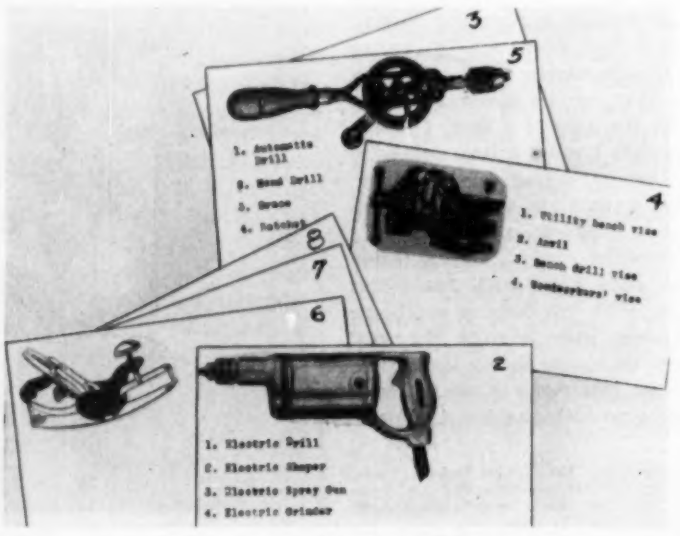


Fig. 1. Identification cards

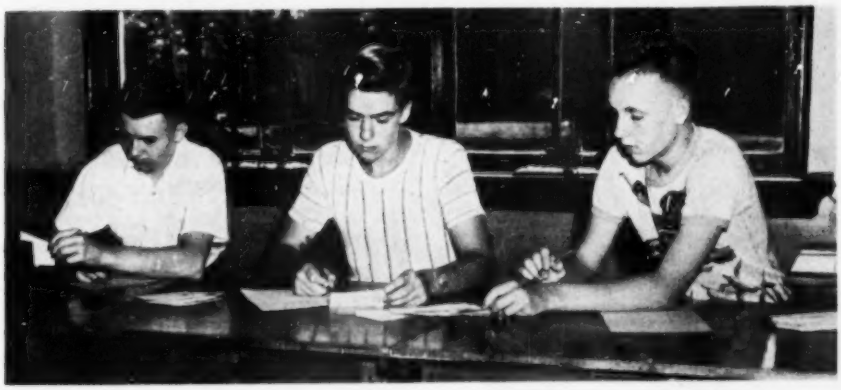


Fig. 2. Pupils taking identification-card test

until the test has been completed. See Figure 2.

To grade the test, a small strip of paper is keyed with the correct numbers and correct answers. This is then placed alongside the pupil's answers, and a very rapid check of the correct answers can be made.

If it is desired, other types of questions can be placed on the cards. Cards can be prepared without drawings or pictures, but with the multiple-choice answers. If other types of objective questions are to be made, it is best to keep them in their respective groups, rather than mixing them. For example, a set of true and false questions, and a set of completions questions, if mixed, are more difficult to take and to grade.

It is felt that the test cards can be justified according to test and measurement standards of other objective tests. The test cards appear to have some distinct advantages over the usual written objective test.

1. The test is flexible. Questions (cards) can be put into or taken out of the test as the teacher desires up to the moment the test is to be given.

2. The test is valid. A sampling can be made of the entire instructional material of an area or of a semester's work. The test can be as long or as short as time will permit, and still cover the instructional material given in the course.

3. The test is highly objective. Personal bias has been excluded in the scoring of the answers. Objectivity is obtained because the pupil simply selects the correct answer from several, and writes down the number.

4. The test is a visual test. It tests the pupil's knowledge of the "things he sees." The pupil will not have to read and understand additional words and sentences.

5. The test is easy to grade. The test sheet must be prepared as directed, and the key must be correctly made. The test can then be scored with ease as directed.

6. The test is economical, as the cards can be used over and over again, and they can be used in a variety of tests such as area test, six-week tests, and final examinations. The paper for the test sheet can be of poor quality since there is very little writing involved in taking the test.

7. The test stimulates interest. The test seems to be more of a challenge than the usual objective test, and it appears to motivate the student in his work and study.

Suggestions

1. Several small card file cases can be used to store the various grade or area tests.

2. A set of 90 cards is now being used in the seventh grade. This test is used as a final examination and can be taken in one hour. A set of 150 cards is used in the eighth grade. This test is a final examination and can be taken in one hour. A set of 200 cards is used in the ninth grade. This test also can be taken in one hour, and is used as a final examination.

3. By changing the number, or by placing different colored numbers on the cards, a given card can be used in several tests.

Disadvantages

1. Teacher must supervise the test. The teacher must place groups of cards among the students, sort the cards into proper numerical sequence, and help slower pupils in arranging the cards.

2. Cards may be lost during a test and the teacher must have extra cards for replacement.

3. Cards will wear out from handling, and will have to be replaced and revised.

4. Slower pupils will hold up the taking of the test, so that it is necessary to place faster pupils together at a point where the test is started. If the class is large, it is best to divide the cards into three or four stacks. These stacks should be placed at three or four starting points with the faster pupils starting each group. All students will soon be working on the test cards if this is done.

5. If cards are used continuously in the same sequence, the pupil may associate the card's appearance with the correct answer.

A LIBRARY OF INDUSTRIAL TEXT AND REFERENCE BOOKS

CARL E. FETHEROLF

Teacher of Industrial Arts
Hazel Park, Mich.

The schools of the metropolitan area of Detroit dedicated a library of industrial text and reference books to the late John Herman Trybom, first director of vocational education in the city. The library was established in a central place to be of service to Wayne University students, and to university and public school teachers and supervisors. Students find the library useful for both technical and professional courses. Teachers and supervisors use it to select texts and references for their courses. The organization and the work involved in establishing this service may be credited to those persons in the Detroit area interested in industrial education. Donations of time, money, and accessories has made possible one of the most complete libraries of its kind.

The collection of books in the library is an outgrowth of publisher's services, over a period of many years, to Wayne University, the Detroit public schools, and other school systems of the metropolitan area. As new books were made available for use, the publishers sent inspection copies to various supervisors and department heads in the vocational department. This service was recognized as one offered to the vocational department, rather than to individual supervisors. At that time, texts were stored on shelves in one supervisor's office. In 1938, Dr. Verne C. Fryklund, chairman of the Industrial Teacher Education Department of Wayne University, and Andrew D. Althouse, supervisor of vocational education in the Detroit public schools, arranged to combine the publisher's contributions into a library. This was a co-operative project of the two departments.

As years passed, the number of books which accumulated created problems of storage and location; to find a certain

Students and teachers make use of the industrial text and reference material in the Trybom Library

Left to right: Dr. G. Harold Silvius, professor of industrial education at Wayne University; Thomas McKinnon, teacher of industrial arts, Grosse Pointe Schools; F. R. Kepler, formerly supervisor of vocational education in the Detroit schools; Erwin Rademsky, student in the department of industrial teacher education at Wayne University; and Alvin Lappin, doctoral student at Wayne University

book on electricity, for example, was almost an impossibility. There was a need for a catalog system in which all books were classified and labeled. A graduate student, Richard Ramsdell, undertook the task of classifying and cataloguing the books as a part of his master's essay. From that time on, the co-operative efforts of the Detroit public schools' vocational department and the industrial teacher education department of Wayne University made this library useful for inspection of text or reference books and material.

With the reorganization of the collection, part time clerical help was needed to provide service necessary to catalog and shelve new books. The department of industrial teacher education assigned, at that time, a student assistant who performed such duties as cataloguing, ordering new books, acknowledging titles received, and rearranging shelves.

Securing adequate space for shelving was the next problem; the books had grown in number and could no longer be housed in one office. Books were to be found in any one of three rooms, and still more space was needed. Since separate housing appeared to be the solution, Wayne University provided a room in one of the office buildings. Preliminary plans included selection of furniture for the new room, and a decision to dedicate the library to the founder of the vocational education program in the Detroit public schools.

Appropriately, the desk that Dr. Trybom used during his years in the Detroit schools was restored by the Mu Sigma Pi Mathetes, and placed in the library. To accommodate card catalogs, circulars, and book catalogs, the inside of the drawers was redesigned without altering the original appearance. An oil painting of Dr. Trybom, painted by Lenard Shellaskie, a talented student at the George Trade School, was presented by Mrs. Trybom. A suitable bronze plaque for the door was designed and cast at the Cass Technical High School. Book plates were designed and printed indicating the joint sponsorship of the library by the Detroit public schools and Wayne University. As time progressed, many other contributions were made, and are still being made, by interested individuals and groups.

The library is organized to be of service to teachers, supervisors, and students in the metropolitan area of Detroit. Facilities are provided for study and inspection of books. Comfortable chairs, excellent lights, and indices are provided to encourage frequent use.

For the monthly meeting of the Detroit vocational department heads and supervisors, new books may be removed from the library upon request and placed upon display. Other arrangements to review books can be made through the Division of Instruction, or through the Department of Industrial Teacher Education at Wayne University.

Supervisors, department heads, and teachers may use the library at their convenience. The library is open from 8:30 a.m. to 5:00 p.m. Monday through Friday, but arrangements may be made to have it open on Saturday or during the evening. Students may use the library at their convenience, but are encouraged to do their work in the library so that no book will be removed or misplaced. For the purpose of determining extent of use, visitors are asked to sign a guest book.

In the Detroit public schools, text and reference books are selected on the basis of recommendations by teachers and supervisors concerned with their area of instruction. When book selections are made, no one person is responsible for the decision; it is a result of evaluations and recommendations of several persons. In being used for this purpose, the library serves both the schools and publishers.

Books have been placed on the shelves by publishers primarily to eliminate multiple requests for sample copies. Publishers also look upon the library as a place to display books on industrial and vocational education, and as a place where the publisher's representatives may come to inspect current text and reference books used in the Detroit area. When the publisher's representatives come to Detroit, they inventory their own collections to determine what should be added or removed; a card catalog includes a set of cards arranged alphabetically under publishers' names. A representative can rapidly inventory every item displayed by his company.

An advisory council meets at least once during the year to establish policies and initiate plans for improvement. The membership is composed of teachers and supervisors of the Detroit area who have shown interest and given much time to the project. Through the help of all people interested in industrial education, the Trybom Library and the service it offers will continue to grow.

A CHIP CARVED JEWEL BOX

O. S. HARRISON
Head, Industrial Arts Department
University of Georgia
Athens, Ga.

A Project for the Better Craftsman

Chip carving is an ancient craft which has almost passed out of existence. Many of the old masters embellished their work with chip carving. It is a true craftsman technique and skilled home craftsmen may do well to master it.

Simple as well as complicated designs are adaptable to chip carving, depending, of course, on the craftsman's skill and desire to accomplish something of creative value.

The turned jewel box here embellished with chip carving will stimulate the best of workmen. It is not a simple undertaking but can be accomplished by most experienced craftsmen if they will expend the effort.

The tools required are few and simple. Some clamping device, a wooden mallet, and three or four chisels of various sizes.

Many woods are excellent for chip carving, possibly the best ones being walnut, mahogany, maple, cherry, and red gum. The wood should be straight grained and free of knots and all blemishes.

Procedure for Constructing the Jewel Box

1. Choose your box pattern and turn it out on the lathe. Sand smoothly but do no finish sanding. Retain the markings for position on the faceplate because after the carving the project will be replaced on the lathe for further sanding. Note the central portion for smaller articles and note the flange to fit the lid. See Figure 1. Design your own box as to size, shape, etc.

2. Choose your design for carving. See Figure 2. You will note the one suggested is rather complicated so you may leave out some of the detail. It may be well to lay out a similar design which you plan to use on a practice piece of the same kind of wood.

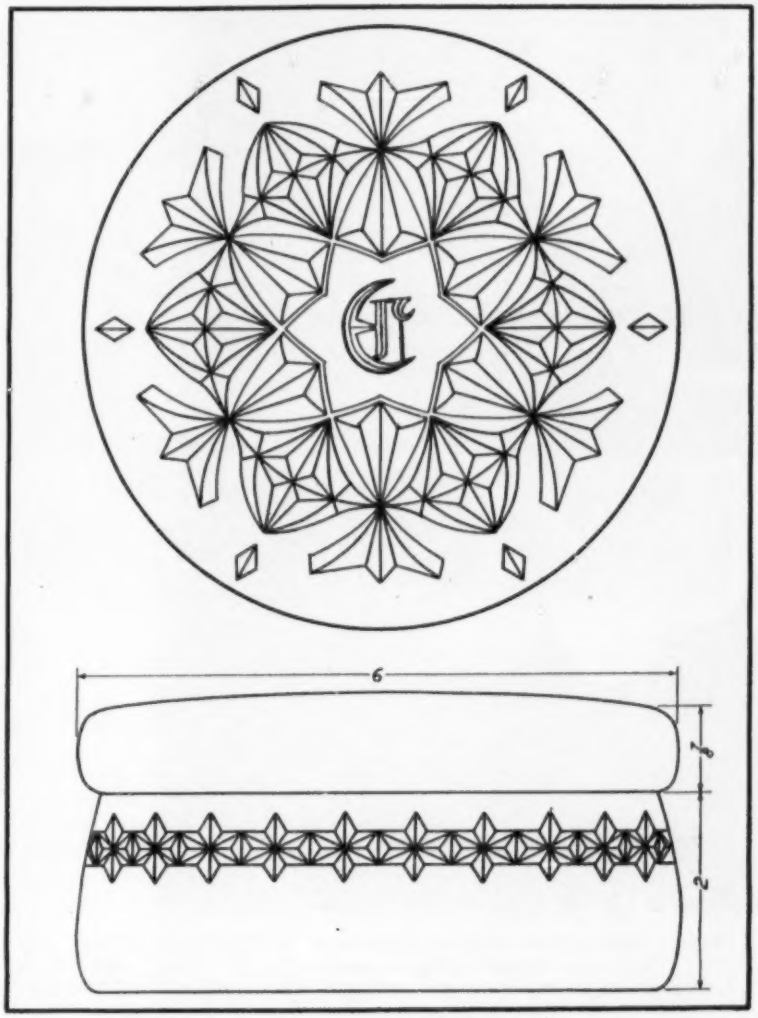


Fig. 2. Details of turned jewel box

3. Transfer the design to the lid. This may be done by cutting out the design with sharp scissors and using the pieces of paper as stencils. Carbon paper usually is not good because you will need fine sharp lines. A hard lead pencil is best.

4. Follow the lines closely. Start the cut with a straight nose chisel. See Figure 2. Be definite with the cuts and make them clean with no suggestion of torn wood. Do not make the flat cuts too deep and be sure that all similar cuts are of equal depth.

5. As a general rule you can make more accurate cuts with the use of a mallet. See Figure 3. The mallet is now shown but is used for clean definite cuts. Be sure the piece is clamped tightly to the workbench or table. When using the mallet the chisel is guided with the left hand. A skilled workman always makes use of a vise or clamps, thus giving him a third hand.

6. Frequently it is well to use a sharp pointed knife or chisel. See Figure 5. You will note the adhesive tape on the blade which is used to protect the fingers and thumbs.

Fig. 1. The inside of the jewel box

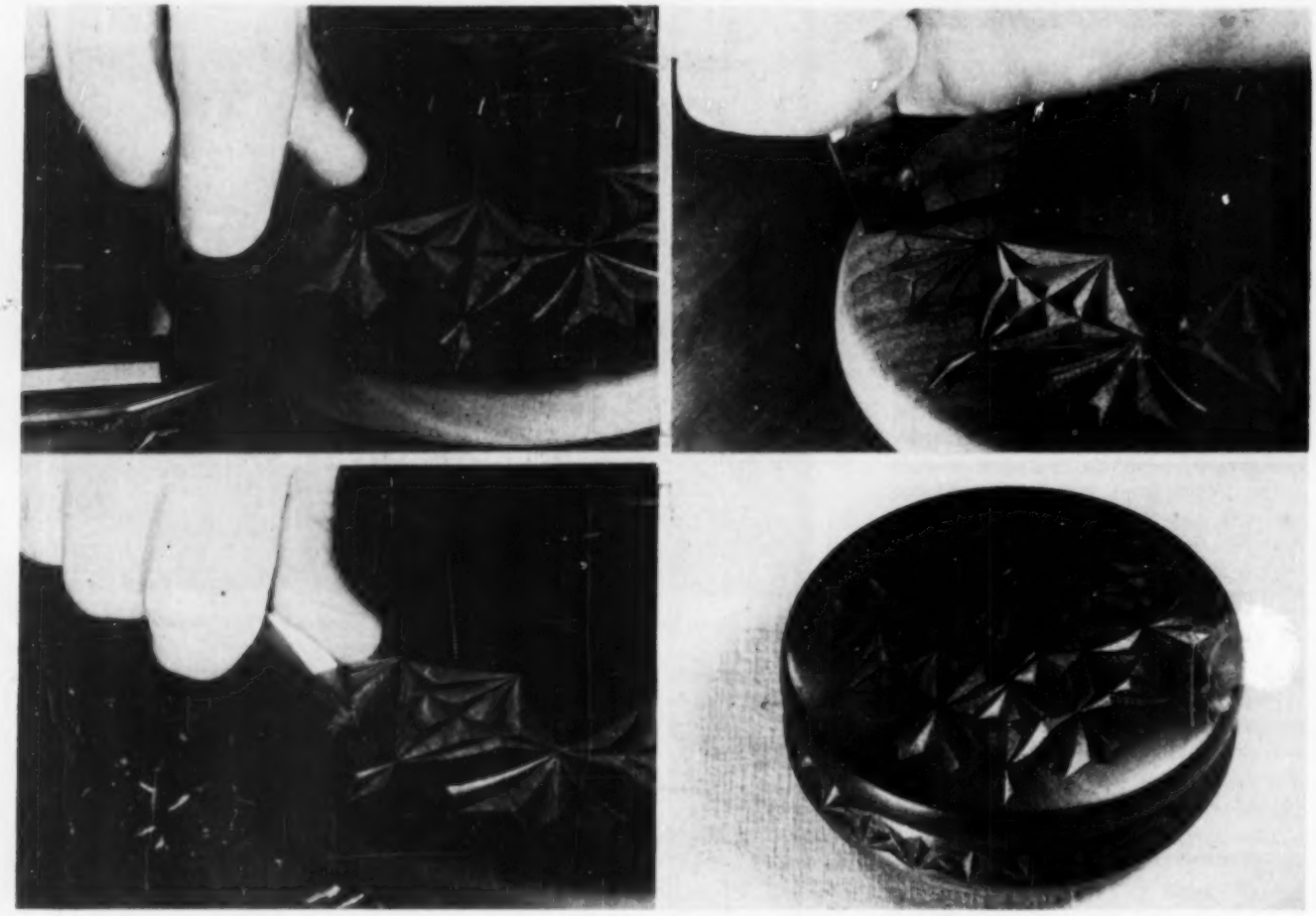


Fig. 3 (top, left) — Using a straight nose chisel; Fig. 4 (top, right) — accurate cuts are more easily made when using a mallet; Fig. 5 (lower, left) — using a sharp pointed knife; Fig. 6 (lower, right) — the finished jewel box

7. Complete the carving on the lid, then repeat the same process on the sides of the box. This cutting is harder because of the curvature of the wood and a portion of the cutting is on edge grain. Needless to say the chisels must be sharp.

8. Replace in the lathe and sand lightly to remove scratches and finger prints. Do not sand too hard. Keep the cut edges sharp.

9. Dark stains give the appearance of age in wood carving. You may obtain an excellent finish with repeated coats of oil by rubbing each coat thoroughly. Thin shellac, well rubbed with pumice or rottenstone and oil, and wax will satisfy the most critical.

10. Cut out a piece of green felt and glue to the base.

RIGHTS OF OUR FELLOW MEN

WINFRED H. MOTT
Fort Collins, Colo.

According to figures released by the Association of Casualty and Surety Companies, over 36,000 people were killed in automobile accidents last year. To most of us, these are only figures and have very little meaning. They will continue to have little meaning until we, or someone close to us, are caught in this expanding trap. The question is, "What can we do to stop this mass murder of our fellow citizens?"

We in America are justifiably proud of the progress we have made in such a short span of time. In less than three hundred years we have grown from a small group of people seeking freedom from persecution to one of the strongest and wealthiest nations in the world. Everything we have is the best, and if it is not the best, then we continually work to improve it until it is.

The Automobile Has Become a Necessity

The modern automobile is only one result of our outstanding progress. Scientific research and engineering skill have been poured into it and the outcome has been a thing of beauty as well as utility. It has evolved to a point where its possession is almost a necessity, for a large part of our economy is based upon its use. It has become a standard by which we measure our fellow men. We have built a vast network of highways to increase the utility of our automobiles. These highways have been extended to the point where it is almost an impossibility to find a place in this great country where one cannot go in his automobile.

Good Roads Increase Rather Than Decrease Accidents

All of this is due to progress, and progress we must if we are to remain healthy, wealthy, and strong as a nation. But if, as a result of progress, we must sacrifice the lives of 36,000 of our people every year, then maybe we better slow up for just a little while and get caught up with ourselves.

This is a problem of national concern and steps have been and are being taken in every

(Continued on page 18A)

What A-V experts say about Pageant pre-lubrication

"The permanent pre-lubrication of the Pageant Projector solves a basic maintenance problem. We encourage the widest possible use of projectors . . . which means operation by many different people. Since oiling schedules are not always dependable, the elimination of this chore should result in even wider use and longer life for 16mm. sound projectors."

M. N. Hillyer
Hoover Brothers, Inc.
St. Louis, Missouri

"Central California educators have found projector lubrication unnecessary, inefficient, and time-consuming—that's why more new Pageant Sound Projectors are being sold here than any other."

Carroll W. Rice, *Mgr.*
Audio-Visual Dept.
Fresno Camera Exchange
Fresno, California

"Since we have been handling the Pageant Projector, we are happy to report that service due to faulty lubrication has been nil. You've got something with that permanent pre-lubrication feature."

L. C. Vath
Audio-Visual Aids
Sharpsville, Pa.

"The problem of proper lubrication of sound projectors in schools and churches is a major item of concern. In using and demonstrating the Kodascope Pageant Projector, we find that permanent pre-lubrication is one of the outstanding projector features today."

Adrian L. Testerman
Graham Photo Supply
Greenville, South Carolina

To keep their full attention... curb these 5 projection difficulties

1. **Projector breakdowns due to faulty lubrication**
2. **Distracting projector noise**
3. **Lack of over-all picture sharpness**
4. **Garbled, sing-songy, unnatural sound**
5. **Can't-hear-in-back-of-room trouble**

Only with a Pageant can you overcome all these difficulties, because only the Pageant offers *all five* of these important features:

Permanent Pre-Lubrication: Improper lubrication is the chief cause of damage to sound-projection equipment. But with a Pageant, oiling is *never* a problem! The Pageant—exclusive among all 16mm. sound projectors—is permanently pre-lubricated at the factory!

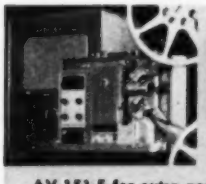
Permanent Quietness: Nylon gears, a nonskip pulldown mechanism, and other features make the Pageant outstandingly quiet. And pre-lubrication makes noiseless operation a *permanent* feature. Noise means wear . . . and Pageant design keeps both to a minimum!

Built-in "Field-Sharpening Element": Conventional projection lenses have curved fields. With these, you can get *only* the center or *only* the edges into sharp focus at one time. But in the Pageant, a built-in "field-sharpening element" eliminates this curvature . . . makes possible sharp, clear, over-all focus.

Sound Focusing: Since different types of 16mm. film have the sound track in different positions, a fixed scanning beam cannot give quality sound reproduction from all types of film. If it is adjusted for originals, for example, fidelity falls off when you run "dupes." *Only* the Pageant has a built-in Fidelity Control that lets you precisely focus the scanning beam for crisp, clear sound with any type of film.

Optimum Sound—Anywhere: Amplifier power alone is no assurance of proper sound coverage. *Comfortable* sound is the product of three factors—sound output, speaker capacity, and distribution. Pageant sound is always adequate because the rated wattage is *deliverable* power, honestly available under actual conditions . . . because speakers are of ample capacity for their amplifiers . . . and because *matched* auxiliary speakers are available for acoustically difficult locations.

The Pageant, Model 1, shown above, lists at $375. For detailed information on this and other Kodak projectors, call your Kodak Audio-Visual Dealer or mail the coupon. (*Price subject to change without notice.*)



Now . . . Kodak Projectors to meet every 16mm. need

The Pageant, Model 1, for average sound-and-silent shows . . . the super-brilliant Pageant AV-071 for hard-to-darken locations . . . the two-case Pageants AV-151 and AV-151-E for extra power output, speaker capacity, and tone control . . . the Model AV-151-S and AV-151-SE Pageants—extra-powerful projectors in single, easy-to-carry cases. Plus the heavy-duty Kodascope Analyst Projector for critical study of 16mm. silent films. Also available through your Kodak Audio-Visual Dealer—the Eastman 16mm. Projector, Model 25, for theater-type installations.

12-193

EASTMAN KODAK COMPANY, Dept. B-V, Rochester 4, N.Y.

Send name of nearest Kodak Audio-Visual Dealer . . . information on projectors checked:

☐ *Kodascope Pageant, Model 1* ☐ *Kodascope Pageant, Model AV-071*
☐ *Kodascope Pageant, Models AV-151 and AV-151-E* ☐ *Kodascope Pageant, Models AV-151-S and AV-151-SE* ☐ *Kodascope Analyst* ☐ *Eastman 16mm. Projector, Model 25* ☐ *Auxiliary speaker equipment*

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ORGANIZATION_____

ADDRESS_____

CITY_____ STATE_____
(Zone)

Kodak

RIGHTS OF OUR FELLOW MEN

(Continued from page 358)

state to do something that might reduce this terrible death rate. In one state, in the past month, road blocks were set up at random points along the highways and every car was stopped and checked. Out of 4000 cars and drivers checked, 1100 had some defect that was not up to the standards set by the laws of the state. It is true that some of the violations were minor in nature. Such items as faulty brakes, poor lights, and poor tires are not minor items. If this same figure holds true for the country at large, then at least one out of every four automobiles on the highways is not up to the standards set by our laws.

We have spent billions of dollars in the building of our highways; every year we spend more, either to improve existing ones, or to build new ones. This in itself might help to cut this death rate down but to date this has not been the case. Improvements that have been made have served to increase the speed and ease in which these highways can be traveled.

An army of highway patrolmen are on duty on all our major highways at all times and these men are doing the best they possibly can. It might be that we can increase the number of patrolmen and pass more rigid laws in an effort to curb this slaughter. There is no doubt that this might help. However, we in America by our very heritage resent these "too rigid" controls. We feel that they represent encroachments upon the rights and ideals upon which this great country was founded.

We Must Teach Our Students to Recognize the Rights of Our Fellow Men

Safe driving courses have been included in some of our schools, and this represents a step in the right direction. It is only the first step for many reasons. Chief among these is the fact that it reaches so few of our people. As yet it has been impossible to make these courses available to all of our schools. Our more populated areas have driver training courses and they are making progress. What about the small schools scattered throughout the country where they have not as yet been made available? They have been placed in the last two years of the high school, and in the colleges, and yet we know that at least 40 per cent of our students drop out of school before they get that far. How are these people going to be reached?

We must teach more than safe driving, for safe driving in itself will not save the person who is hit by his careless fellow man. We must teach one of the principles basic to our heritage and the development of this country, and that is, "a recognition of the rights of our fellow men."

Until this principle has been so firmly instilled in the minds of every man, woman, and child who is privileged to drive an automobile, and until they can think of little else when they get behind the wheel of an automobile, we are going to continue to waste the lives of our people at an ever increasing rate.

There's Extra Value in Millers Falls Screw Drivers
It's on the job that blade strength and durability are put to the test — and Millers Falls screw drivers have proved on the job that their extra quality pays off in better performance and longer life. In every detail, these basic tools are built to exacting standards of craftsmanship. Each blade is hammer-forged from tough, high grade steel — is carefully heat-treated and cross ground — is individually torque tested.
No matter what the need, there is a Millers Falls screw driver to meet it. Complete line includes automatic, ratchet, offset and plain types. All lengths.
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Questions and Answers

THE DIVISION ON OUR STANDARD RULER

1151. Q.: I am seeking information on the origin of our standard ruler — 1/16 in., 1/8 in.,

(Continued on page 20A)

There is no name better known than K&E to draftsmen, engineers, architects for the tools and materials they work with.

Whether for drafting equipment, such as drawing instruments, scales, T-Squares, triangles; for drawing and tracing papers and cloths; for reproduction materials; for slide rules — to name just a few things — K&E is known as "tops".

There is a K&E School Line for students too, made in the K&E tradition of quality, and rightly priced for the student's pocket.

Have you had your copy of the 1953-1954 K&E School Catalog? If not, drop a card in the mail to Keuffel & Esser Co., Hoboken, N. J.

KEUFFEL & ESSER CO.

EST. 1867

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QUESTIONS AND ANSWERS

(Continued from page 18A)

¼ in., ⅜ in., ¾ in., 1 in. Can you give me an explanation of this? — *C. G. Z.*

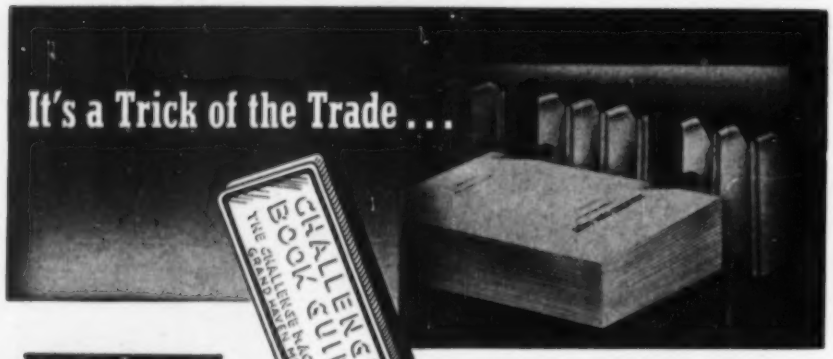
A.: At the time of the Revolutionary War the American Colonies used the same weights and measures brought over to this country from England. Since, at that time the English system was not based on a scientific foundation, the units used, both in England and in our Colonies, varied from place to place.

Since then, of course, uniform standards of measurements throughout the world have been made possible because common standards have been accepted by all civilized countries.

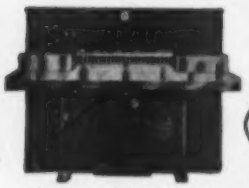
The U. S. Meter standard is preserved in the National Bureau of Standards at Washington, D. C.

The standards for length that were adopted was the yard of 36 in. The fractional division of the inch, most likely followed previous usages. When the sixteenths were adopted, is, as far as I have been able to ascertain, no longer traceable.

It may be taken for granted, however, that the fact that it is easy to divide any given distance into two parts thus obtaining ½ of the original, and then doing the same with the ½ thus getting a ¼, and then dividing the ¼ into halves to obtain ⅛, and further dividing the ⅛ into halves to obtain 1/16, had something to do with the dimensions we are using today. — *J. J. M.*



To get an even cutting edge and assure neater book trimming, use a pair of guides on the backgage. You can buy a book guide to fit any backgage finger up to ⅛" thick.



Challenge 370 Automatic (Hydraulic Clamp) Cutter

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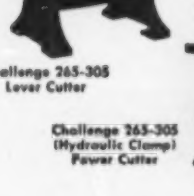
Challenge Cutter

Diamond (Hand Clamp) Power Cutter

Challenge 265-305 Lever Cutter



Challenge 265-305 (Hydraulic Clamp) Power Cutter

Regardless of your shop size, there is a Challenge cutter for you. There are 11 styles and 7 sizes to choose from, ranging from lever cutters in bench and floor models — to power cutters with hand or hydraulic clamp. Each of these cutters has been perfected by Challenge engineers to give the operator *maximum* protection . . . more working freedom . . . and precise control of cutting operation. A Challenge cutter is a long term investment that pays off in less maintenance . . . greater safety . . . more accurate cutting. 7038

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News Notes

♦ A series of remote control filmstrip projectors which allow teachers, ministers, instructors, lecturers, etc., complete control of their presentations from any point in the room was announced by The Society for Visual Education, Inc., Chicago.

The *Industrialist*, available in 500-, 750-, and 1000-watt models, incorporates the famous "Synchrowink" mechanism which advances pictures quicker than a wink. The user advances the picture by merely pressing a push button on the end of a 10½-ft. cord which may be lengthened by adding one or more 35-ft. extensions which are available as accessory items.

Both 35mm. filmstrips and 2 by 2-in. slides may be projected.

More detailed information is contained in an illustrated folder available by writing to *Society for Visual Education, Inc., 1345 Diversey, Chicago 14, Ill.*

♦ The air force announced on October 20, that pilot training will be opened to civilian high school graduates beginning November 1. The move is designed to increase the number of applications for flight training.

♦ *Mechanical Engineering*, a feature-length film in color about training, job opportunities, and the future in the field of mechanical engineering, has been produced by the School of Engineering at Michigan State College.

The film shows how a young man can become a mechanical engineer, what opportunities there are, and what goals he can expect to reach.

The 20-minute film will be shown to interested groups without charge.

♦ Announcement has been received from John F. Rider Publisher, Inc., 480 Canal St., New York, N. Y., that effective October 15, 1953, the list price of Rider's packaged service information on television receivers, known as TV TEK-FILE, has been reduced to $1.50 per pack to the television technician.

Rider TV TEK-FILE is devoted exclusively to factory prepared and factory approved television receiver service information. The data consist of schematics on all production runs, chassis views, voltage data, alignment instructions, and test wave forms.

♦ A study of the industrial vocational program of the St. Louis, Mo., public schools, and recommendations for improving it, will be made by a committee of representative citizens constituted recently.

The committee, invited to undertake the evaluation by Superintendent of Instruction Philip J. Hickey, will make use of studies prepared by Hickey's staff and reports by outside consultants.

♦ A film of a day in the life of a high school science teacher will be a unique presentation in the "Cavalcade of America" television series. It will be on the ABC-TV network at 7:30 p.m., Eastern Standard Time, Tuesday, October 27, and will be televised in more than 30 local areas during the following two weeks.

It is a documentary treatment of how Rolland Galdieux, a chemistry teacher at the Kenmore, N. Y., high school, works and lives; and how he, as a teacher, inspires young people and develops their interest in chemistry. The supporting "actors" are his family, his students, nearby businessmen, and his associates at Buffalo University, where he is working for his Ph.D. degree.

The film was made by Louis de Rochemont for the DuPont Company entirely on location in the classrooms and elsewhere in Kenmore High School, in the Gladieux home, and at other places in Kenmore.

♦ An expanded program in industrial arts is now being offered at the Long Beach State College, Long Beach, Calif. The work is co-ordinated by Dr. C. Thomas Dean, formerly of Iowa State College, Ames, Iowa. The program provides work leading to both the special secondary and the general secondary California teaching credentials with a major in industrial-arts education.

♦ A completely new and revised Educational Catalog listing all the filmstrips, 2 by 2 slides, and color slide sets for the school market, as well as a section devoted exclusively to equipment and accessories has just been released by the Society for Visual Education, Inc.

The 58-page catalog is conveniently arranged by subject areas — literature and language arts; social studies; the sciences; mathematics; health, safety, and physical education; guidance and child development; vocations; and fine arts. Filmstrips are all grouped together in one individual section as are the slides and slide sets.

The catalog is available from any S.V.E. dealer or by writing direct to *S.V.E., 1345 Diversey Parkway, Chicago 14, Ill.*

♦ Techniques used in connection with the dry coloring of Lustrex styrene colorant blend molding compound are thoroughly discussed in a new manual offered by Monsanto Chemical Company's plastic division.

The booklet contains 29 pages of information including discussions of equipment, colorants, the process itself, molding aids, coloring aids, and methods for obtaining special coloring effects.

The manual — "Product Information Bulletin No. 85" — may be obtained by writing to the *Plastics Division, Monsanto Chemical Co., Springfield, Mass.*

♦ A new vocational training course covering field handling of natural gas is now made available by the Division of Production of the American Petroleum Institute.

It was developed by the University of Texas, under a grant-in-aid from the institute. Although it is primarily intended to train company employees in the gathering, treatment, and control of natural gas on a producing lease, the course also has application to some phases of natural gasoline plant operations.

Instructors are full-time professionals employed and specially trained by the state departments of vocational training. The course is comprised of 30 hours of instruction — 10 periods of three hours each, according to William H. Strang, Director of the Production Division.

♦ Baldwin-Wallace College, Berea, Ohio, has joined with Illinois Institute of Technology in offering a combined educational program in liberal arts and engineering.

Under the program students receive a twofold education; they earn degrees in both liberal arts and engineering at the same time.

Addition of the combined program at Baldwin-Wallace brings to 18 the number of schools participating with Illinois Tech in this educational plan.

This is how the program operates:

Students attend Baldwin-Wallace, or one of the other co-operating schools, for three years, then spend two years at I.I.T. Upon completion of the five-year program, they receive a bachelor of arts degree from their former school and a bachelor of science degree in some field of engineering from Illinois Tech.

♦ *Working Together for Safety* is the title of the National Safety Council's new employee rules' manual. The handy 32-page booklet contains instructions in safe work habits applicable to employees in most plants.

The practical experiences of workers, supervisors, and safety specialists have established the safe practices covered, beginning with a list of general safety regulations and continuing with special sections on machine operation, hand tools, power tools, protective clothing, fire prevention, materials handling, and many other related topics. *Working Together for Safety* will serve as a permanent guide and handy reference for each employee.

For a free sample copy and prices for quantities, write the *National Safety Council, 425 N. Michigan Ave., Chicago 11, Ill.*

♦ Walt Disney's "The History of Aviation" has been accorded top honors in the Third Annual Motion Picture Festival of the Film Council of Greater Boston, "in recognition of exceptional accomplishment in achievement of purpose as a classroom film."

This honor came to Walt in the first year of the Disney organization's entrance into the 16mm. motion-picture field, which is an achievement in itself.

"The History of Aviation," an 18-minute cartoon with color by Technicolor, covers man's attempt to conquer the air from the first flights at Kitty Hawk to the dawn of modern jets flying at supersonic speeds.

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. . . are possible with G-E Rectifier Transformers, from 1 to 700 volts, when using buck-boost connections. Specially designed for industrial electronics experiments, complete internal wiring diagrams and polarities are shown on the nameplate. 0.4-kva windings provide sufficient capacity for most educational purposes. Write for bulletin GEC-776 to General Electric Co., Sect. 687-96, Schenectady, N. Y.
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New Publications

Industries for Small Communities

By Arthur E. Morgan. Cloth, 112 pp., 5⅜ by 8¼ in., illus., $2. Paper, $1.50. Community Service, Inc., Yellow Springs, Ohio.

This book contains an extremely interesting account of how small industries located in rather insignificant towns can do things that will be profitable to their own communities besides assisting the business, industry, and science of the entire country.

The book is not a story about fictitious characters, but rather an account of men who have so affected their environment that it exerted its influence on the lives of many and changed a small village and an equally small educational institution into an establishment of learning and a community that has a national reputation.

The book deserves a wide acceptance.

Sunset Ceramics Book

By Herbert H. Sanders. Paper, 96 pp., 8⅛ by 10¾ in., illus., $1.75. Library binding, $3. Lane Publishing Co., Menlo Park, Calif.

A fine description of how to make pottery objects by hand processes. The book is really a manual of self-instruction and the beginner, when once started, will quickly fall in love with this interesting work.

The book contains 210 fine illustrations to accompany the step-by-step directions on how to start, what tools and what processes to use to make some really worth-while ceramic pieces.

Educators Guide to Free Slidefilms

By Mary F. Horkheimer and John W. Diffor. Paper, 185 pp., 8⅜ by 10¾ in., $4. Fifth edition, 1953. Educators Progress Service, Randolph, Wis.

This is a revised edition which lists 609 titles from 72 different sources.

Besides the titles of the sound or silent slidefilms it gives the number of frames, the running time, dates of release, annotations, terms and conditions of loans, and the names and addresses of the agencies from which the slidefilms can be obtained.

Many of these slidefilms will be of great interest to teachers of industrial arts and vocational education.

Educators Guide to Free Films

By Mary F. Horkheimer and John W. Diffor; educational consultant John Guy Fowlkes. Paper, 516 pp., 8½ by 10⅞ in., $6. Thirteenth Annual Edition, 1953. Educators Progress Service, Randolph, Wis.

This is a completely revised edition which documents 2574 film titles of which 562 titles are new in this edition.

This edition also contains "The Significance of Films in Curriculum Improvement" by Dr. John Guy Fowlkes.

This guide brings to you the titles of 16mm. and 35mm. sound or silent films, and informs you of their running time, dates of release, terms and conditions of loans, and the names and addresses of the agencies from which they may be obtained.

It lists many films of interest to teachers of industrial arts and vocational education.

Four Centuries of European Jewellery

By Ernle Bradford. Cloth, 226 pp., 7½ by 10 in., illus., $12. Philosophical Library, 15 East Fortieth St., New York 16, N. Y.

An exceedingly interesting book on jewelry beginning with the renaissance and coming down to the present time.

Besides a discussion of the craftmen who made the jewelry, and the precious metals, pearls, and gems used by them, there are numerous fine illustrations of the jewelry used in the various rings, brooches, pendants, and necklaces made and worn throughout the years.

There are 48 pages of excellent illustrations.

Enameling, cameos, precious metals and stones, and the craft of gem cutting also are described.

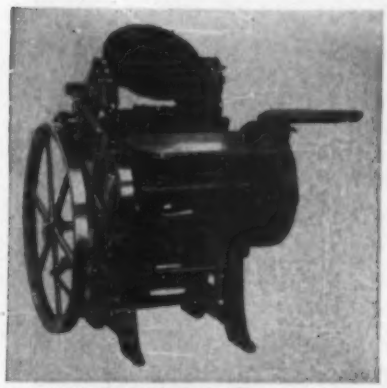
Education in Sweden

By Alina M. Lindegren. Office of Education Bulletin 1952, No. 17. 90 pp., 30 cents. For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.

Education in Sweden furnishes data on elementary, secondary, and higher education institutions in Sweden. This information is useful to U. S. school officials who deal with student transfers. The publication discusses other matters of mutual interest to educators in Sweden and in the United States. The study is based on data gathered by the author during her visit to Sweden in 1949 and supplemented since then through documentation.

Other Office of Education publications on education in other countries which were recently issued are *Education in Turkey*, 30 cents; and *Higher Education in France*, 20 cents.

CHANDLER & PRICE { PRESSES and PAPER CUTTERS



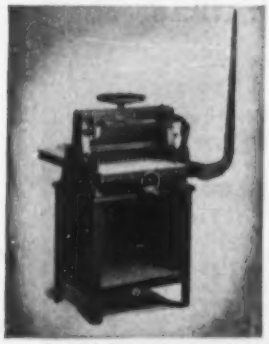
C&P NEW SERIES PRESSES These presses in sizes of 8x12, 10x15, 12x18 and 14½x22, provide the student with equipment that furnishes all practical requirements of hand fed press operation. May be equipped with flywheel, belt and platen guards. Also furnished for treadle operation instead of motor drive.

The Standard for Printing Education

C & P presses and paper cutters have been standard equipment in commercial plants and schools for over 50 years. So, the selection of C & P equipment for printing classes places before the students *practical* equipment exactly as used in commercial practice in the entire printing industry.

In addition, special safety features are incorporated, when desired, in C & P presses and paper cutters so that all safety requirements are fully satisfied.

For practicality—for safety—the foresighted administrator recommends . . . Chandler & Price.



C&P PILOT PRESS A thoroughly efficient little press, chase 6½x10, that teaches basic principles of press operation with exceptionally fine printing results.

C&P BENCH CUTTER An efficient, small size cutter that handles sheets up to 19" x 24". Equipped with two-handed safety control.

"HANDBOOK OF PLATEN PRESS WORK" *is one of the outstanding aids to printing furnished without charge to printing instructors. If you do not have a copy, just request one.*

THE CHANDLER & PRICE COMPANY

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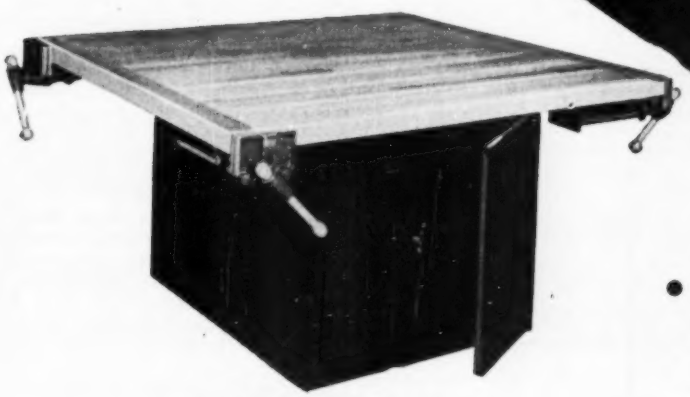
The exclusive **B G** — **4 in 1 Woodworking Benches**

Instantaneous Hits!

L-4 LOCKER TYPE
come with 12 individual storage lockers, numbered and equipped for padlocks.



DD-4 DOUBLE DOOR
has, instead of 12 individual storage lockers, a built storage area divided by a midway horizontal shelf.

● Not one – but two – modern, space-saving, work-speeding Work Benches to choose from! They're exclusive with B G! They're both extra big – 64" x 54" – with ample working space for four students. Each corner of their specially constructed 2¼" solid maple top is equipped with a strong 5 CD Columbia Vise with vise ends of each bench reinforced with heavy 5" battens firmly bolted for solid foundation.

Bases, of durable heavy gauge metal attractively finished in olive green, are recessed to provide maximum work area with minimum floor space. There's nothing like them – for greater efficiency, economy and unbeatable value. Choose the type that best suits your needs and order today.

IMMEDIATE DELIVERY

Use your big B G Master Catalog for the added savings of time and money one source buying provides. More than 15,000 items are described and illustrated — just about everything needed for industrial arts, vocational training, fine arts and crafts — every item covered by our complete guarantee.

BRODHEAD GARRETT CO.

4560 E. 71 ST. CLEVELAND 5, OHIO "EVERYTHING IN INDUSTRIAL ART SUPPLIES"

EQUIPMENT LITERATURE

NEW LOGAN ENGINEERING COMPANY CATALOG

The Logan Engineering Company catalog, just off the press, describes the newest features of the Logan line of 9-, 10-, 11-, and 12-in. lathes, lathe accessories, and the Logan 8-in. shaper and accessories.

Especially newsworthy are the new Logan 12-in. swing lathes described on pages 2, 3, 4, and 5 of this catalog. The widespread interest in this new lathe centers on the extreme rigidity and smoothness under heavy cutting loads that result from its heavy ball-bearing spindle and extra heavy construction throughout, and on the fact that it offers a variable speed drive as optional to the standard V-belt drive, at no increase in cost.

For a copy of this catalog, address a request on a school letterhead to *Logan Engineering Co., Lawrence and Lamon Ave., Chicago 30, Ill.*

(For Convenience Circle Index Code 1008)

CRAFTOOLS CATALOG NO. 54

Craftools, Inc., has published a new catalog on ceramic equipment and tools.

This catalog is quite comprehensive and describes potter's wheels, both of the kick-wheel, and the electric power type.

Besides the wheels, this catalog lists modeling and decorating wheels, ball mills, plaster bats, turning and modeling tools, block scrapers, sprayers, kiln stands, wedging boards and tables, treadle wheel kits, ¼ and ⅓ h.p. motors.

This catalog also lists lapidary (gem cutting) outfits, accessories, and gem-cutting material assortments.

For your copy of this interesting catalog write to *Craftools, Inc., 401 Broadway, New York 13, N. Y.*

(For Convenience Circle Index Code 1009)

ATLAS PRESS SAFETY POSTERS

Atlas Press Company is introducing Safety Sam's series of timely posters on shop safety.

These posters will come to you gratis. Your name on the Atlas mailing list will also enable you to keep posted on new Atlas tools, shop projects, and other important developments of interest to shop-men.

For your copy write to *Atlas Press Co., Kalamazoo, Mich.*

(For Convenience Circle Index Code 1010)

MASONITE "PEG-BOARD" PANELS

"Peg-Board" panels and fixtures now are available in lumberyards as a product nationally distributed by Masonite Corporation. The versatile combination of perforated hardboard and interchangeable hangers has been widely accepted for display, storage, and decorative purposes.

Their distribution through thousands of lumberyards makes Masonite "Peg-Board" panels and fixtures available in homes and schools for dozens of space-saving purposes and for unusual decorative effects. The product is a combination of top quality hardboard, with evenly-spaced perforations, and matched metal hanging fixtures which can be moved instantly to any hole in the board without tools.

The self-locking hangers, available in more than 60 varieties, are used for putting walls to work — hanging innumerable objects ranging from kitchen utensils to tools in the workshop.

These "working walls" come in eight standard sizes: 24 by 36 in., 24 by 48 in., 24 by 72 in., 24 by 96 in., 36 by 48 in., 48 by 48 in., 48 by 72 in., and 48 by 96 in. There are four types: ⅛-in. Tempered Duolux (smooth on both sides), ⅛-in. Leatherwood (with embossed pattern on one side), ⅛-in. Tempered Duolux with a 24-in. square pattern, and ¼-in. Tempered Presdwood, a heavy-duty board with stronger fixtures for use in the garage and similar locations.

For a copy of a four-page illustrated descriptive pamphlet, write to *Masonite Corp., 111 W. Washington St., Chicago 2, Ill.*

(For Convenience Circle Index Code 1011)

NEW SOUND MOTION PICTURE BY UTICA DROP FORGE AND TOOL CORPORATION

Progress of 5000 years in forging metal will be shown in a 20-minute sound motion picture now in production for the Utica Drop Forge and Tool Corporation.

The story will trace the use of pliers and wrenches through the centuries. Three-dimensional, activated dioramas will be used to show ancient methods of smelting and forging, and the Metropolitan Museum of Art has contributed friezes of Egyptian bronze forgings to add background for scenes of that period in history.

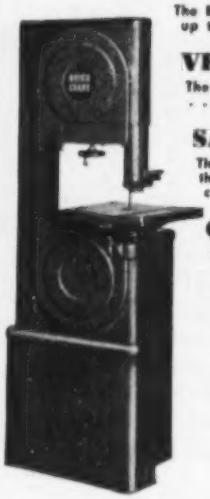
The craft shops of Kenneth Lynch & Sons of Wilton, Conn., were engaged to produce medieval tools for the film, and the Village Blacksmith Shop of the re-created Village Crossroads of the Farmers Museum at Cooperstown, N. Y., has

(Continued on page 27A)

Consider What You Want
IN A BAND SAW

Before you buy, check all these points. The BOICE-CRANE 14" BAND SAW

was designed to best fill the needs of the AVERAGE SHOP. Are you average? Do you want



SPEED?
The Boice-Crane saws 2 to 4 times freer, faster and smoother! Blade speed up to 4,100 f.p.m. at 1,200 r.p.m.

VERSATILITY?
The Boice-Crane cuts, sands, grinds (some models even file) any material . . . accurately . . .smoothly.

SAFETY?
The wheels and blade of the Boice-Crane are entirely enclosed, except at the cutting point. The blade guides can be safely adjusted by single control, even when running.

CAPACITY?
The Boice-Crane gives you 13½ inches from the blade to the guard, permitting 27-in. diameter work. From guide to work table: 7¾". Blade widths: 3/16", ¼", ⅜", ½" and ¾". Blade length: 98".

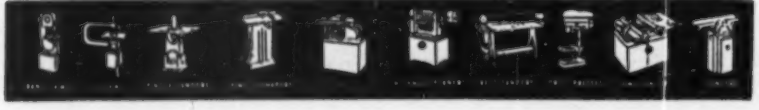
STURDINESS?
The Boice-Crane has a strong, one-piece, welded steel frame. The wheels are strong but light, specially engineered for top cutting performance, with a diameter of 14 inches and a face of one inch. The grease-sealed ball bearings assure long service.

COMPACTNESS?
The over-all height of the floor model is 67 inches. The motor is in a sealed-off compartment in the cabinet base. The 15" x 15½" table tilts on 45° R., 10° L. double trunnions.

MAIL COUPON NOW FOR DETAILS AND PRICES. 12 Models — Single and 8-Speed Backgeared.

FREE!
Big New Catalog on Boice-Crane Woodworking Power Tools for Cutting — Shaping — Drilling — Finishing.

BOICE-CRANE COMPANY
932 CENTRAL AVENUE TOLEDO 6, OHIO
☐ Please send free literature on Boice-Crane Band Saw.
☐ New 52-page Catalog No. 53 on entire line.
NAME.....
FIRM.....
STREET.....
CITY & STATE.....



MAYLINE

The Mayline School Line Tops the Field

This drafting table is one of many fine Mayline classroom products.

DOUBLE WORK BENCH

A proud addition to any wood shop. Thick, hard Maple top, solid oak base — natural finish, rapid acting vise. Single work bench also available.

ALL PRODUCTS SOLD DIRECTLY TO SCHOOLS

MAYLINE COMPANY
Formerly ENGINEERING MFG. CO.
623 No. Commerce St. Sheboygan, Wis.

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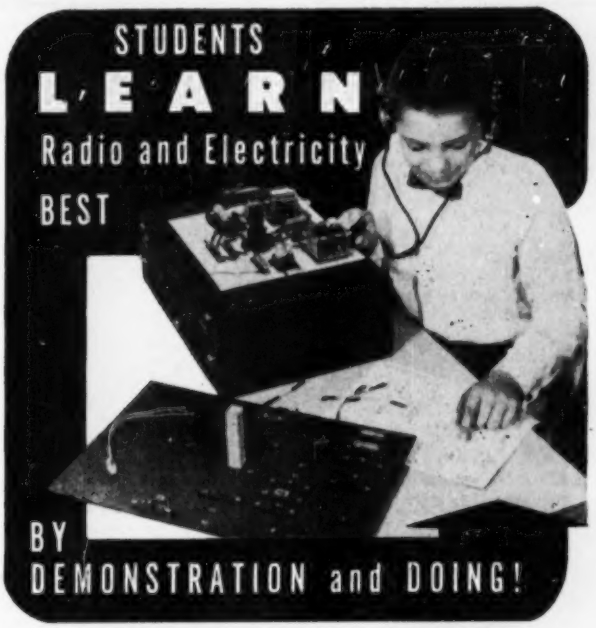


with Board of Education Approved

JIFFY Radio Circuit Kit *

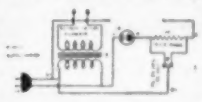
Hook up time actually faster than blackboard drawing of same circuit. This amazing demonstration and training kit was designed by an Industrial Arts teacher. It permits students to watch and then construct more than 24 operating circuits, from a simple crystal set to a two-tube detector-amplifier. Templates and instruction sheets on each circuit let the student TRAIN HIMSELF.

Complete RADIO CIRCUIT KIT-
Model 2RF—Contains 10 templates, self-teaching instruction manual, circuit diagram & symbol cards, mounting block, components over 24 circuits and Jiffy connectors. $49.50.
Model AC100 — Complete 3-tube AC amplifier kit $49.50

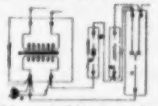
*Pat. Pen.

The JIFFY Connector*
No soldering or tools needed, easy to get on or off yet always makes positive connection. Assures rapid circuit assembly and may be used repeatedly. Included in all S.E. training kit. May also sorted length available-isting equipment. Abe purchased for available. Write for prices.
Patented

STUDENTS GAIN CONFIDENCE BUILDING PROGRESSIVE CIRCUITS THIS SAFE, TEMPLATE WAY

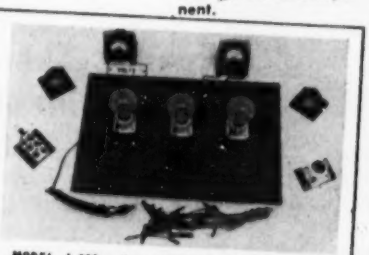


Here is a power supply diagram.



This matching numbered template placed over mounting block, receives correct component.

JIFFY Basic Electricity Kit**
Used as a training aid in schools everywhere. Enables students to interpret a complete range of varied series parallel circuits by actually constructing and measuring fundamental characteristics. Provides thorough training demonstration plus repetitious student participation.



MODEL L-100 — Base panel, 4 lamp sockets, 1 DPDT switch, 1 SPDT switch, fused line cord, Jiffy Connectors, instruction manual with multi-colored circuit diagrams, $7.95 complete.
MODEL L-200 — Same as L-100, plus 0-150 AC voltmeter, 0-5 AC ammeter, 2 3-way switches, $24.50.

**Pat. Pen.

ALL S.E. TEACHER DEMONSTRATION AND STUDENT TRAINING KITS ARE FUSE PROTECTED, COMPLETELY ASSEMBLED OPERATING DEVICES

Inquire about the new "Multicolor" Wall Charts with self-teaching circuit diagrams.

Used and acclaimed by Universities, High Schools and Elementary Schools, Electronic Industries and Institutions.

Write for descriptive brochures on all S.E training aids for science and industry.

SCIENCE ELECTRONICS, INC.
HUNTINGTON, Dept. A NEW YORK

SPECIALIZED SCHOOL SHOP LUMBER

Supplying the right kind of lumber and service for Industrial Arts and Vocational Education Classes is a specialized business. It requires professional knowledge of grade, dryness, workability and service which Shop Instructors should expect.

Our Educational Lumber Division is systematically organized to supply promptly and efficiently your requirements from our large inventory of "ready-to-ship" thoroughly kiln-dried lumber.

No advance in prices as shown in Catalog No. 53.

MAIL US YOUR ORDER TODAY.

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ASHEVILLE, NORTH CAROLINA

FOR TEACHING
BASIC ELECTRICITY
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CROW MODEL 100G DEMONSTRATION KIT

TYPICAL COMMENTS OF USERS

"Really a fine thing for teaching electricity."
"With it I can demonstrate what would otherwise require much talking, in a few minutes."
"The Manual is as excellent as the equipment."

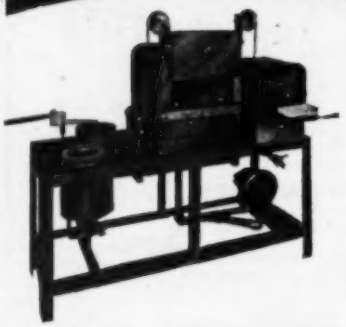
Our Model 100-G Kit was designed for teaching basic or elementary electricity. Ideal for lecture demonstrations before small groups or for student experiment purposes.

Furnished complete with illustrated text-manual.

WRITE FOR FREE ILLUSTRATED BULLETIN.

UNIVERSAL SCIENTIFIC COMPANY, INC.
BOX 336G VINCENNES, INDIANA

EASY FAST



BROADEN
the scope of classroom work with the
JOHNSON
TRIPLE TREAT

Three furnaces in one compact unit for teaching a wide range of heat-treating techniques. Requires only 24" x 64" floor space. The Johnson Triple Treat incorporates a pot furnace for lead, salt and cyanide hardening (pot size 6" dia. x 8" deep); a Quick Acting Johnson Hi-Speed steel furnace with temperature range of 1400° to 2350° F. for fast, economical heat treating any steels, tools, dies and small metal parts (firebox 7" x 13" x 16½"); and an atmospheric fired tempering furnace with a temperature range of 200° to 1100° F. for pre-heating, tempering and drawing (firebox 5" x 7¾" x 13½"). Complete as illustrated with sturdy steel bench and Johnson Blowers.

$595.00 F.O.B. Factory

Individual units in Triple Treat are also available separately. Write for full information.

FREE CATALOG

JOHNSON GAS APPLIANCE CO.
585 E AVENUE N.W. CEDAR RAPIDS, IOWA

New Texts for Your Classes

General Shop

Groneman and Feirer. A new text of the *McGraw-Hill Publications in Industrial Arts.* Presents 128 units in drawing and planning, woodworking, electricity, plastics, leather, and home mechanics. Basic information on tools and materials. 27 projects.

Drawing, Sketching, and Blueprint Reading

Coover. Teaches the student to read industrial drawings and then how to make accurate, legible drawings and sketches with facility and ease. Functional, dynamic, and adaptable.

Machine Tool Operation, Parts I and II New Edition

Burghardt and Axelrod. A thorough revision, presenting the most modern machines and attachments. Many new illustrations, questions, and problems.

Carpentry for the Building Trades New 2nd Edition

Lair. New material on modern construction, materials, and methods. Accompanied by a new **Carpentry Workbook** containing work sheets, test and lesson sheets, study guides, and work progress reports.

McGRAW-HILL BOOK CO., INC. 330 West 42nd Street New York 36, N. Y.

any sore
that
does not heal

...is the first of the seven commonest danger signals that *may* mean cancer...but should *always* mean a visit to your doctor.

The other six danger signals are— 2 A lump or thickening, in the breast or elsewhere 3 Unusual bleeding or discharge 4 Any change in a wart or mole 5 Persistent indigestion or difficulty in swallowing 6 Persistent hoarseness or cough 7 Any change in normal bowel habits.

For other facts about cancer that may some day save your life, phone the American Cancer Society office nearest you, or write to "Cancer"—in care of your local Post Office.

American Cancer Society

EQUIPMENT LITERATURE

(Continued from page 24A)

been photographed to depict the hand forging of a wrench to service a carriage owned by Alexander Hamilton.

Utica Drop Forge & Tool Corporation now has two sound films in use and over 500 schools, colleges, and industrial firms have viewed these films in the past year. Their requests for more information on the subject of forging suggested this new film.

The film is being produced by Mohawk Productions of Utica, with Lyndon S. Cornell directing, M. B. Newhouse, cinematographer, and Henry J. Zellweger as technical director for *Utica Drop Forge and Tool Corp., Utica 4, N. Y.*

(For Convenience Circle Index Code 1012)

HOBART ARC WELDING NEWS

Volume X, No. 3, Hobart Arc Welding News, a 20-page booklet of interesting photographs and articles on welding from all over North America, is now available. Copies are mailed free of charge to anyone interested in arc welding.

Get your copy by writing to *Hobart Brothers Company, Troy, Ohio.*

(For Convenience Circle Index Code 1013)

BUSINESS & PERSONAL NEWS

W. F. ROCKWELL HEADS BUSINESSMEN IN DUQUESNE UNIVERSITY FUND DRIVE

Col. Willard F. Rockwell, chairman of the board of Rockwell Manufacturing Company, has been named chairman of a seven-man committee heading the business and industry phase of the Duquesne University Diamond Jubilee Fund Campaign here.

Appointment of Col. Rockwell, who is also chairman of the Duquesne president's advisory board, was announced by the Very Rev. Vernon F. Gallagher, president of the school.

Top executives of six other leading Pittsburgh firms will serve on the business and industry committee with Col. Rockwell.

AMERICAN HANDICRAFTS COMPANY ADDS A NEW STORE

The American Handicrafts Company recently opened a new store at Fort Worth, Tex.

This is a great boon to many teachers, who, in doing business with this firm, had to send their orders to East Orange, N. J.

The 8-page leaflet issued by the new store, describes books on basketry, weaving material, cane, stool and footstool kits, basketry and tray bases, reed tools, beads, metalcraft tools and projects, art material, silk-screen materials, etc.

For full information and a copy of the 1953 catalog, write to *American Handicrafts Co., 302 Throckmorton St., Fort Worth, Tex.*

DR. BRUCE J. MILLER RECEIVES APPOINTMENT

Dr. Bruce J. Miller has been appointed assistant manager, Research Administration of Union Carbide and Carbon Corporation. Dr. Miller will co-ordinate the recruiting of scientists for the corporation and will assist Dr. Raymond W. McNamee, the newly appointed manager, in the personnel aspects of the corporation's research activities.

C. W. SNYDER MADE DISTRICT SALES MANAGER

Charles W. Snyder has been named district sales manager for DeWalt Inc., subsidiary of American Machine & Foundry Company.

Mr. Snyder's territory will include the entire state of Delaware, New Jersey from Trenton south, and the state of Pennsylvania from Lewistown east.

RICE PUMP AND MACHINE COMPANY MOVE TO NEW LOCATION

The Rice Pump and Machine Company, manufacturers of centrifugal pumps, die filers, and profile grinders, have transferred their manufacturing plant from Grafton, Wis., to enlarged quarters in Belgium, Wis.

For bulletins covering their products, write to *Rice Pump and Machine Co., Belgium, Wis.*

H. W. OETJEN APPOINTED PROTO SALES MANAGER

H. W. Oetjen has been appointed sales manager for Proto Tools. In his new position, Mr. Oetjen will supervise all Proto sales in the United States. He was formerly director of marketing and research, but had devoted much of his time to sales activities.

Companies Mr. Oetjen had been affiliated with prior to joining Proto include the Tide Water Associated Oil Company, Fairchild Engine & Aircraft Corporation, Fairchild Camera & Instrument Corporation, and J. O. Manufacturing Company.

For the finest lumber in your school shop, the name to remember is . . .

PAXTON . . .

By using PAXTON lumber you provide your school shop with utmost quality which means sturdy and attractive projects for your students. PAXTON lumber is properly graded and selected, reducing waste and spoilage. Write the yard nearest you for a free price and stock list of the complete PAXTON line and investigate the many reasons schools, just like yours, are using PAXTON lumber and materials.

BEAUTIFUL WOODS

is THE handbook for the woodworking industry, showing everything about lumber, species, and specifications. Order your copy today — only $1.00.

Write to the yard nearest you for a free catalog!

FRANK PAXTON LUMBER CO.

Specialists in Industrial Arts Lumber and Plywood

WRITE TO YARD NEAREST YOU FOR FREE CATALOG

Offices and Yards at:

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Denver, Colorado - - P.O. Box 6796 Stockyard Station
Des Moines, Iowa - - - - - - - - - - - - P.O. Box 683
Fort Worth, Texas - - - - - - - - - - - - - P.O. Box 1225
Kansas City, Missouri - - - - - - - 6311 St. John Avenue

Up-to-date, classroom tested

BOOKS WHICH HAVE HAD *Best* RESULTS

1. AIRCRAFT SHEET METAL BLUEPRINT READING	$2.75
2. AIRCRAFT SHEET METAL WORK	4.50
3. CONCRETE BLOCK CONSTRUCTION FOR FARM AND HOME	3.25
4. ELEMENTARY STRUCTURAL DESIGN	5.25
5. STEEL CONSTRUCTION	5.00
6. STEEL SQUARE	2.50
7. DIRECT CURRENT MOTORS AND GENERATORS	3.50
8. ARMATURE WINDING	3.00
9. TRANSFORMERS	3.50
10. MANUFACTURING PROCESSES—MATERIALS	5.00
11. MANUFACTURING PROCESSES—PRODUCTION	5.50
12. MECHANISM	4.25
13. METALLURGY	5.00
14. STRENGTH OF MATERIALS	5.25
15. PATTERN MAKING	3.00
16. TOOL DESIGN	5.00
17. MATHEMATICS FOR INDUSTRY	5.50
18. PRACTICAL MATHEMATICS	3.00
19. SLIDE RULE SIMPLIFIED	3.00
20. GRAPHIC ARTS PROCEDURES	3.75
21. PSYCHOLOGY FOR LIFE ADJUSTMENT	3.25
22. HOW TO TALK MORE EFFECTIVELY	3.25
23. THIS WAY UP	2.25
24. ALL ABOUT ME	.90
25. HOW TO READ FOR SELF IMPROVEMENT	3.25

Please send me on examination the books indicated by the numbers circled below:

1 2 3 4 5 6 7 8 9
10 11 12 13 14 15 16 17 18
19 20 21 22 23 24 25

Name.....

School.....

Address.....

City.....Zone.....State.....

AMERICAN TECHNICAL SOCIETY

Dept. W-478
848 East Fifty-Eighth Street
Chicago 37, Illinois

SHOP EQUIPMENT NEWS

A NEW IMPROVEMENT ON "PULL-PUSH" RULES

Stanley Tools announces a new "Pull-Push" Rule made for taking accurate inside and outside measurements. Designed for shop students, mechanics, hobbyists, and homecrafters, the new "Pull-Push" Rule No. 6386W, features "Direct Reading" of inside measurements, and eliminates chance for costly error.

Stanley No. 6386W direct reading "Pull-Push" rule

A red indicator on the window of the case points to exact inside measurements on the white blade when the case butts against the work. This obviates the necessity of adding the width of the case.

Clear black graduations and numbers are baked on the white enamel surface. The flexible-rigid blade, half-inch wide, is graduated in 16ths on both edges for the entire length, and in 32nds on the upper edge for six inches. A "True-Zero" self-adjusting hook always gives exact inside and outside measurements.

For further information, write to *Stanley Tools, New Britain, Conn.*

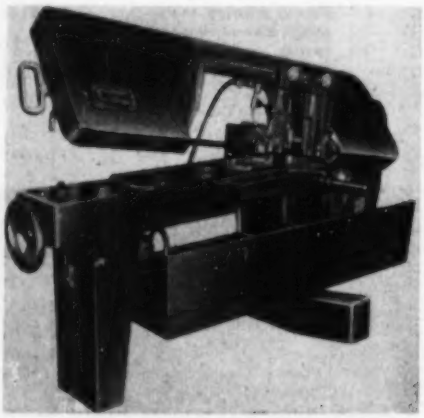
(For Convenience Circle Index Code 1001)

NEW METAL CUTTING BAND SAW

The Kalamazoo Model 8C, a new horizontal metal cutting band saw, has just been announced by the Machine Tool Division, Kalamazoo Tank and Silo Company.

This band saw cuts 8-in. round stock, 16-in. flat stock, 8-in. pipe, and a variety of shapes including very thin sections. It cuts with an accuracy of a few thousandths, with a minimum of kerf, and it leaves no burr.

The saw frame descent through the sawing operation is correctly maintained by a hydraulic mechanism. The cutting action of the saw blade is easily visible to the operator. All parts are completely enclosed and blade changes can be made in a matter of seconds.



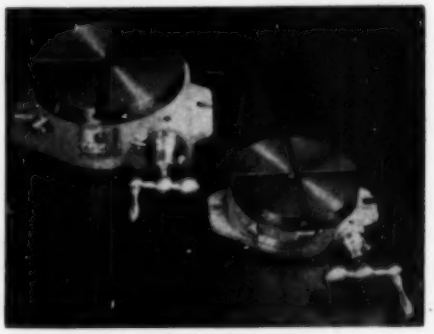
Model 8C Horizontal Metal Cutting Band Saw

Detailed information and specifications are available from the *Machine Tool Division, Kalamazoo Tank and Silo Co., 255 Harrison St., Kalamazoo, Mich.*

(For Convenience Circle Index Code 1002)

NEW BENCHMASTER 8-IN. ROTARY TABLE

A new 8-in. Rotary Table is added to the 6-in. line produced by Benchmaster Mfg. Company. The 6- and 8-in. models are pictured, showing size comparison. Both models specifically feature low height in order to permit maximum use of vertical machine capacity. The 8-in. table is only 3⅝ in. high; the 6-in. is 2⅛ in. high.



Benchmaster Rotary Table

The Benchmaster 8-in. rotary table construction features a steel worm mounted on an eccentric which can be engaged or disengaged from the gear to permit freewheeling of the table. Twin ball thrust bearings in the quill eliminate backlash between worm and gear. Wear take-up provisions are included. An adjustable zeroing mark permits accurate table settings from any starting position. Dial graduations are $\frac{1}{10}$ deg.

Literature is obtainable by writing to the *Benchmaster Mfg. Co., 1835 W. Rosecrans Ave., Gardena, Calif.*

(For Convenience Circle Index Code 1003)

NEW PROJECTOR FOR STUDY OF 16MM. FILMS

The Kodascope Analyst Projector, a new 16mm. silent projector specifically designed for use by those who wish to closely study 16mm. movies, has been announced by the Eastman Kodak Company.

This projector will specifically meet the requirements of athletic coaches, and others who wish to be able to reverse the direction of films frequently during projection and study in detail action shown on the screen.

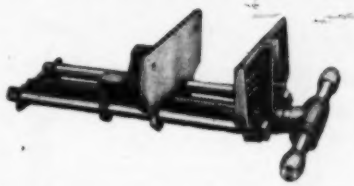
The constant-speed motor causes the blower to give optimum cooling at the projection lamp regardless of the speed at which the projector is running or direction of film travel.

Other new features, which have been built into this projector include a newly developed reflecting coating on the condenser lens and a superior type of heat-absorbing glass which makes a safety shutter unnecessary.

For easy, simple operation, a remote reversing

MORGAN VISES

for Woodworking



With Morgan, you know you have the best in school shop vises. They are made especially durable by testing and proving under actual breaking strain for hard student wear. The quick action vise, pictured above, is the most simple and effective of any of the quick acting types. Ideal for school shop use, there is nothing to get out of order. Protected by an unqualified guarantee, it is designed and built with your school shop in mind!

Write for literature and prices!

MORGAN VISE CO.
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The Kodascope Analyst Projector has 400-ft. film capacity, and operates on 105–125 volt, 60-cycle a.c. power lines. Its over-all dimensions are 12½ by 14¼ by 10¾ in.

For further information write to *Cine Kodak Sales Division, Eastman Kodak Co., Rochester 4, N. Y.*

(For Convenience Circle Index Code 1004)

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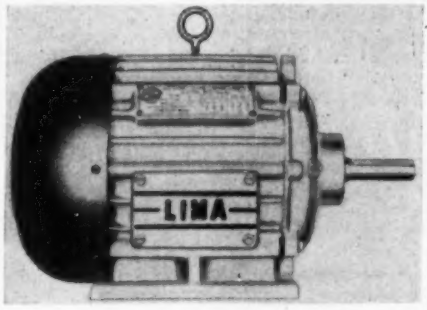
The Lima Electric Motor Company, Lima, Ohio, is now manufacturing a completely new design of totally enclosed, fan-cooled motor. The new Type E is available in ratings of ¾ h.p. at 900 r.p.m. to 20 h.p. at 3600 r.p.m. in NEMA frame sizes 224 to 326 inclusive. A new brochure is available which describes the new Type E and its many advances in both design and performance. Features include: Rigid, seasoned cast



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SHOP EQUIPMENT NEWS

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(For Convenience Circle Index Code 1005)

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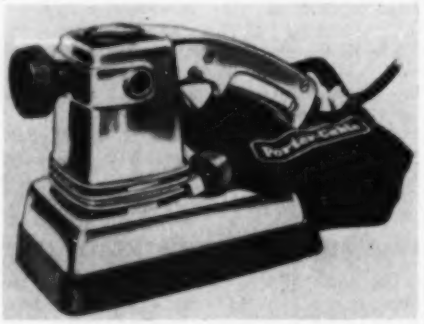

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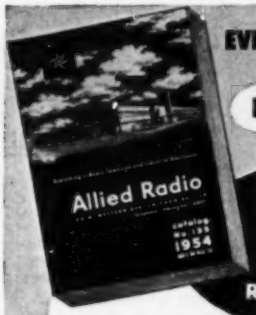

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(Continued on page 24A)

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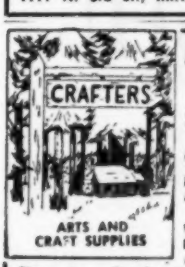

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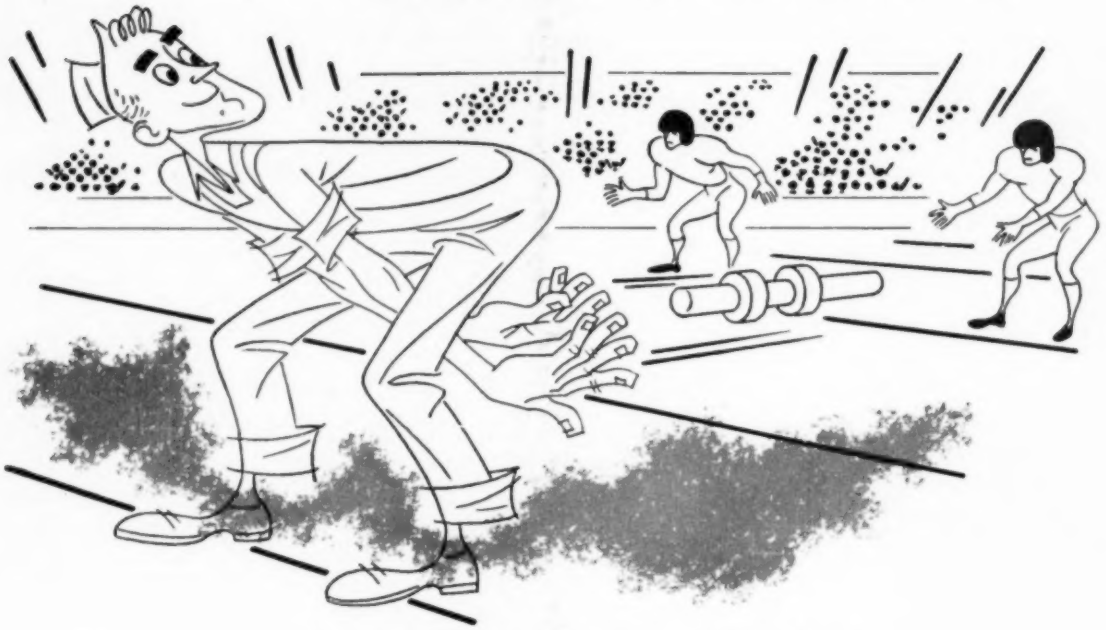

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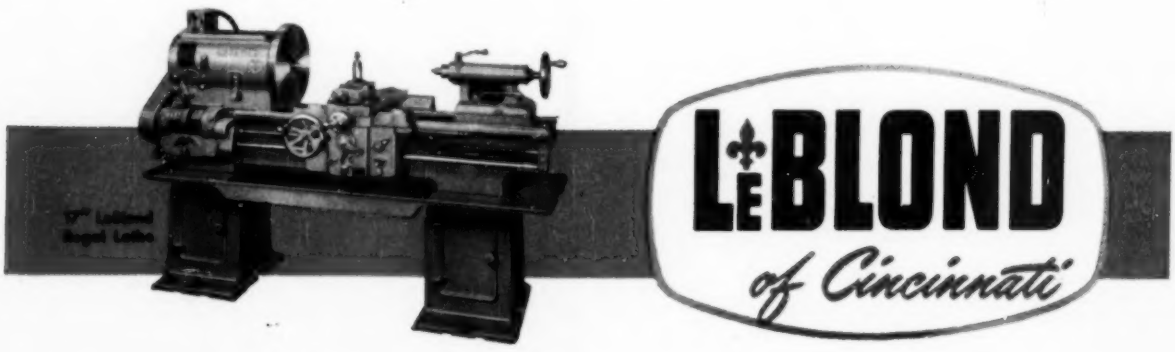

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